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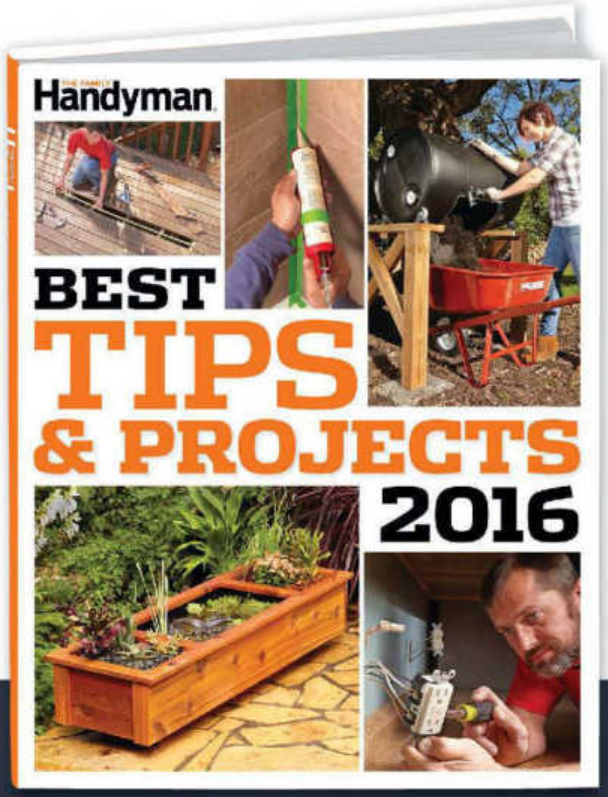

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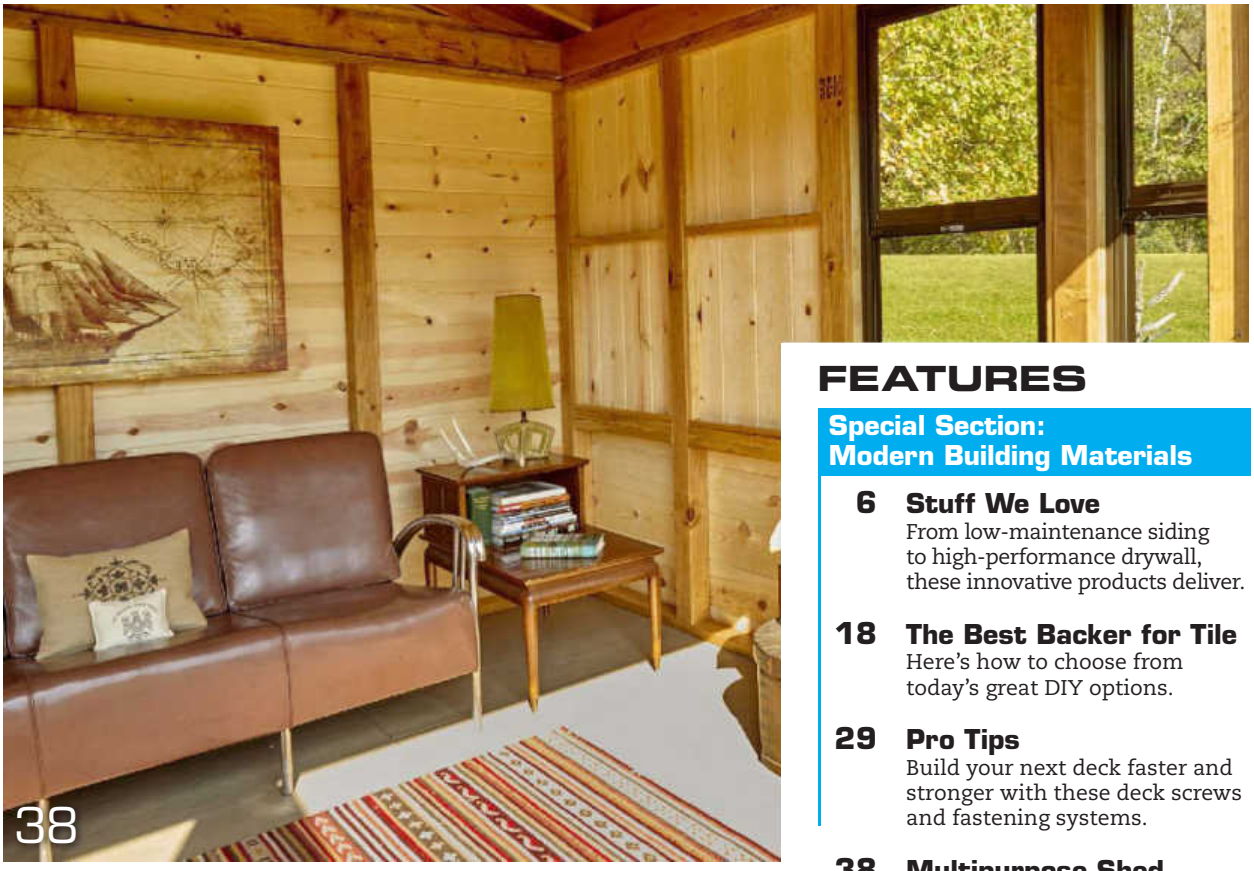

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STUFF we love

BY MARK PETERSEN editors@thefamilyhandyman.com

THE TIMES THEY ARE A CHANGIN'

A lot of technology goes into our homes these days besides smart thermostats and those refrigerators that tell you when you're out of eggs. From siding to plumbing, the amount of research and engineering invested in the new products and materials that surround us is astounding. They're more efficient, lighter, more environmentally friendly, easier to work with and built to last lifetimes. Here is a glimpse into the new and expanding world of modern building products.

BORAL

Trim and siding, up from the ashes

Boral TruExterior trim boards and siding are made from 70 percent recycled materials, mostly fly ash, which is a byproduct of burning coal. The product looks like wood, cuts like wood, mills like wood and installs like wood. The main difference between Boral TruExterior and wood is that the Boral product won't wick water, which makes it safe for direct concrete and ground contact. Cut ends don't need to be primed before installation, and nails and screws can be driven in right up to the edge without splitting or cracking.

PVC is another long-lasting synthetic wood substitute, and might be a better comparison than wood, but Boral has a couple advantages over PVC. It doesn't expand and contract nearly as much, which makes it unnecessary to glue joints. Greater stability also improves its paintability. Boral can be painted any color, even dark colors.

Boral has offered trim boards for a while, but its siding line is relatively new. It now has seven profiles as well as a line of beadboard. Boral TruExterior products cost more than wood but less than PVC. A 16-ft. 1x6 costs about $40. Ask your lumberyard about it or check it out at boralamerica.com.

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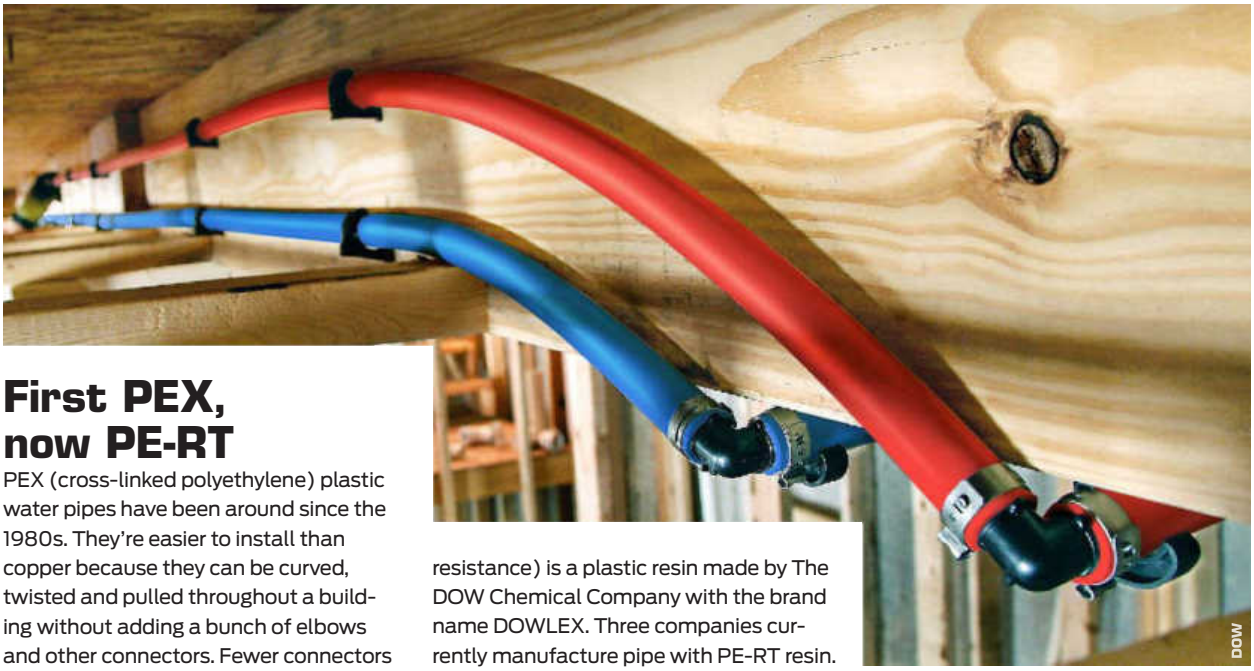

DOW

First PEX, now PE-RT

PEX (cross-linked polyethylene) plastic water pipes have been around since the 1980s. They're easier to install than copper because they can be curved, twisted and pulled throughout a building without adding a bunch of elbows and other connectors. Fewer connectors means less leaks. PEX also costs less and is *much* faster to install.

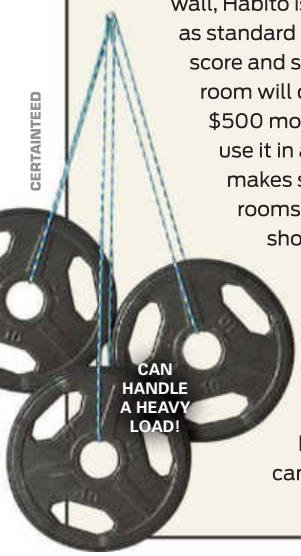
PEX now has some competition from PE-RT, the new kid on the block. PE-RT (polyethylene of raised temperature resistance) is a plastic resin made by The DOW Chemical Company with the brand name DOWLEX. Three companies currently manufacture pipe with PE-RT resin.

PE-RT pipes can be used with most of the same connectors as PEX. They have many PEX-like properties, but they're even more flexible and more resistant to chlorine. In addition, the coils have less memory so you don't have to fight with the coil reflex. PE-RT pipes cost about the same as PEX. You can find them at plumbing supply stores.

High-performance drywall

CertainTeed's new Habito 1/2-in. drywall can support more than 30 lbs. per fastener. Now, large TVs and storage shelving can be hung without using a stud finder or drywall anchors. Habito also blocks more sound than standard drywall and has the same impact resistance as 5/8-in. drywall.

Unlike other specialty drywall, Habito is as easy to cut as standard drywall—just score and snap. A larger room will cost $300 to $500 more to finish, so use it in areas where it makes sense, like living rooms, and garage or shop walls or wherever hanging stuff on the wall is important. Drywall supply stores have it, and home centers can order it.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KIMBERLY-CLARK

Cheap and easy house wrap

Kimberly-Clark has introduced a new house wrap that does just what a house wrap is supposed to do: It keeps bulk water from entering the house while allowing water vapor to escape. But that's not all. BLOCK-IT has a texture that helps drain away any water that may get behind the siding. And installers will love it because it cuts easily and can be installed with staples—no plastic nail caps required. Maybe most surprising, unlike for most new technologies, the price for BLOCK-IT is about the same as if not lower than that of many other house wraps. It's available at some home centers. Call Kimberly-Clark at 1-844-256-2548 for more buying information.

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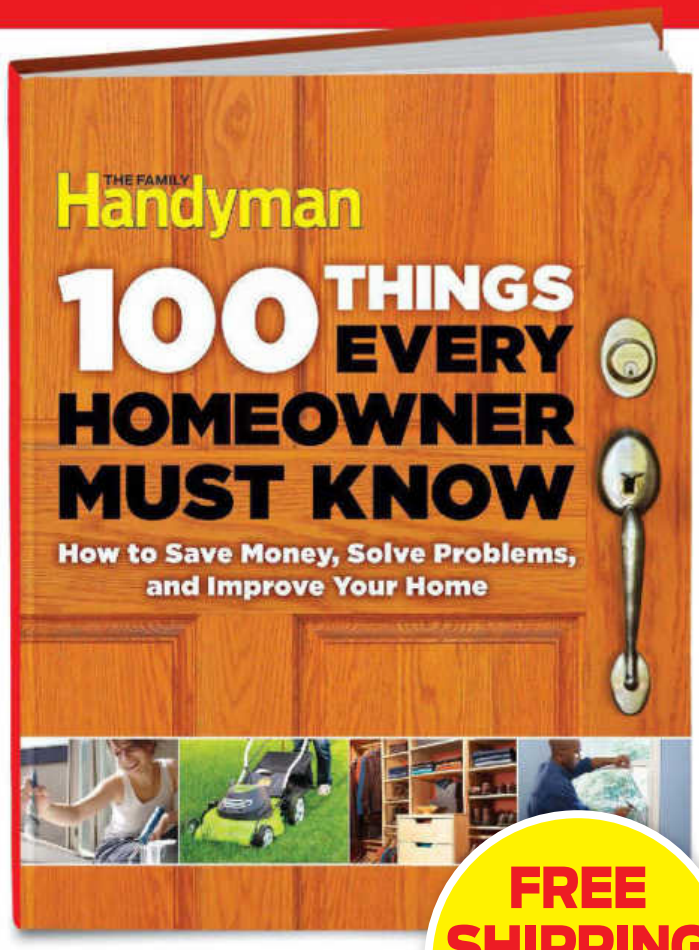

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LOUISIANA PACIFIC

The perfect shed panel

LP (Louisiana Pacific) SmartSide panels are designed to serve as both sheathing and siding. These engineered panels are treated with waxes and zinc borate to resist rot and damage from insects, and the outside of the panel is primed and ready for paint. I've built several sheds for *The Family Handyman* with SmartSide panels. The 4 x 8-ft. panels are available at home centers for less than $35.

Jeff Gorton, Associate Editor

ARMSTRONG

A new way to install ceiling tiles

Tired of that dated and stained popcorn textured ceiling? Cover it up with the new line of decorative tiles and simulated wood planks from Armstrong. The DIY-friendly "Easy Up" mounting system is so simple that you can install a whole ceiling in a day.

The planks and tiles snap into Armstrong's unique metal track and clip system that gets screwed to the joists or rafters. The tiles vary from coffered, patterned, smooth, textured and tin/metal. Or you could pick from 14 different wood-tone planks. Prices start at $1 per sq. ft. with the more exotic materials running a little more than $4 per sq. ft. Go to armstrong.com/residential-ceilings/ to see samples of the tiles and planks. Order it at Lowe's and other retailers.

Rick Muscoplat, Contributing Editor

No-drool adhesive

If you're familiar with construction adhesive, you probably know that the flow rarely stops when you release the gun's trigger. The cartridge usually "drools" for minutes after each use, dropping a sticky blob everywhere you set the gun. Inevitably you'll step in a blob and spread the mess everywhere you go. But Titebond's Fast Set Polyurethane Construction Adhesive doesn't drool. Not even a little.

That alone is enough to make me choose Fast Set. But there are additional advantages: Compared with other polyurethanes, Fast Set is much easier to squeeze out of the tube, even at low temperatures (down to 32 degrees F). It also sets up faster. And like other polyurethanes, it forms super-strong bonds to a huge variety of materials. For buying info, go to titebond.com.

SHERWIN-WILLIAMS

Keep-cool deck stain

Grilling a burger barefoot is no fun if your deck boards are almost as hot as the coals in your grill. Deck boards stained with dark colors can heat up to a toasty 170 degrees F in full sunlight. Sherwin-Williams may have a solution. Its new SuperDeck IR deck stain contains special pigments that actually reflect solar rays, keeping deck surfaces cooler—cool enough that you can finally ditch those flame-proof flip-flops. A gallon costs about $45 at Sherwin-Williams stores.

An easy base for pavers

What's the worst part of installing a paver patio or walkway? The excavation, of course. It's hard work, time consuming and expensive to haul out soil and haul in base.

Alliance makes a polypropylene mat called Gator Base that can be set on a 1/2-in. bed of sand instead of a typical 4- to 6-in. base. It's easy to cut and easy to install, and it handles the same loads as 6 in. of crushed stone. It also protects against damage from freeze-thaw cycles the same as 18 in. of crushed stone! Check out Gator Base at hardscape suppliers. Expect to pay about $2.40 per sq. ft.

ALLIANCE

ROXUL (X2)

Stone-silent insulation

Before you hang that drywall for your basement remodel project, consider filling the stud and joist cavities with soundproofing insulation. ROXUL's Safe'n'Sound stone wool insulation is made mostly from basalt rock and recycled slag. It works great at stopping sound waves from traveling through the walls from one room to another. And if there's any chance your little darling will grow up to be a drummer, be sure you isolate the basement ceiling from the upper floors.

In addition to reducing sound, Safe'n'Sound is resistant to water, rot, mold and mildew. This easy-to-cut insulation also protects against fire, withstanding temperatures up to 2,150 degrees F. ROXUL Safe'n'Sound is available at The Home Depot. One $48 bag will cover 59.6 sq. ft. of 2x4 walls. ROXUL makes stone wool insulation for exterior walls as well.

HUBER

Built-in house wrap

You just gotta like it when one product can take the place of two. Huber Engineered Woods' ZIP System of sheathing panels and tape combines engineered wood with a built-in vapor-permeable water-resistive barrier, eliminating the need for separate house wrap. No house wrap means less labor.

The panels are installed the same way as standard plywood or oriented strand board (OSB). Once the seams are taped, the covering is watertight and can be left exposed for up to 180 days. In windy conditions, this material will remain securely fastened, while traditional house wrap can catch the gusts, loosen and blow off.

The ZIP System is available at many lumberyards. On an average-size home, you'll pay about $500 more for this upgrade over standard OSB and house wrap. But you'll make up a lot of that in labor savings!

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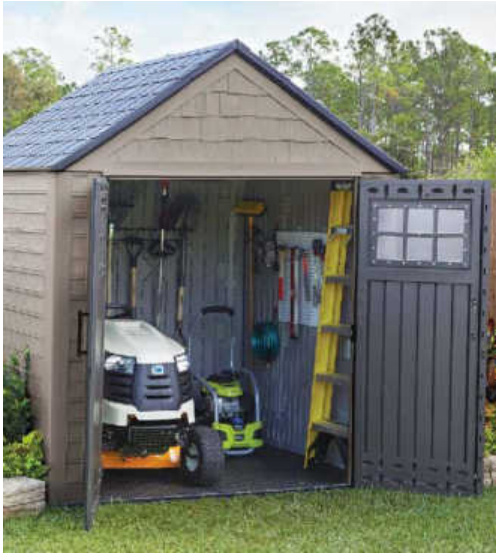
Plastic plywood

The trim on my house is 100 years old—and it looks it. So I'm replacing the trim with cellular PVC, which will never split or rot. I use mostly 3/4-in.-thick PVC boards, but sometimes PVC sheets are a better option. The 4 x 8-ft. sheets are made from the same material but come in various thicknesses, just like plywood. I built these porch columns from PVC sheets with just a fraction of the waste that boards would have produced.

There are several manufacturers, but I use AZEK, which is available in thicknesses ranging from 3/8 in. to 1 in. Prices start at about $100 per sheet. For more on working with cellular PVC, go to familyhandyman.com and search for "PVC trim."

Gary Wentz, Editor-in-Chief



RUBBERMAID

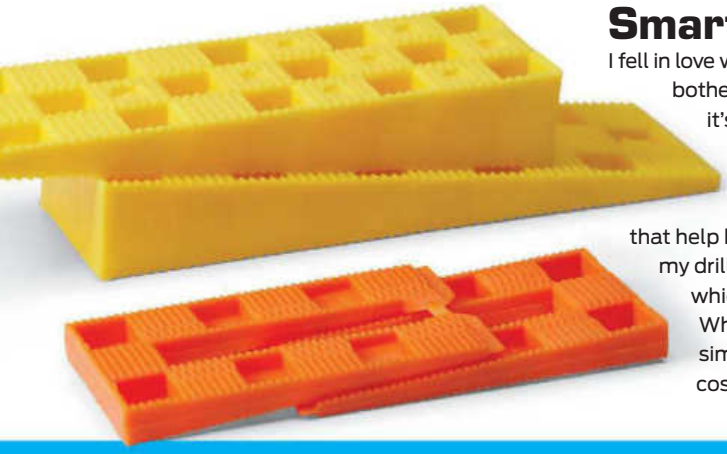
HDPE, a fast and maintenance-free storage solution

High-density polyethylene plastic (HDPE) is tough, lightweight and weather resistant. It won't rot and never needs paint. If those qualities sound good to you and you need a fast storage solution, consider an HDPE shed.

The 7x7 Rubbermaid Big Max storage shed shown here is big enough to store yard and garden tools, a pressure washer and a snow blower. And the sturdy floor can easily handle the weight of a riding lawn mower.

In just a few hours, and with the help of a buddy (who probably owes you anyway), you can build this maintenance-free shed. Assembly requires only a couple ladders, a few simple hand tools and afterward perhaps a cold beverage or two. The hardest part might be creating a flat spot in your yard.

The Big Max has lockable doors, and the HDPE panels are rugged enough to resist those wayward baseballs from the neighbor kid. It's available at Lowe's and other retailers for about $600.



Smarter shims

I fell in love with composite shims the first time I used them and haven't bothered with wood shims again. Now there's a new shim in my life—it's the SmartWedge by Lee Valley Tools. Like composite shims, these polyethylene shims are uniformly sized, they won't rot or split, and they don't compress under load (up to 2 tons). What I love about these shims are the interlocking teeth that help keep them exactly where I want them while I'm fumbling for my drill or nail gun. And the orange ones have a void in the middle, which allows me to slide the shims around existing fasteners. Who knew there was this much room for improvement over the simple wood shim? With four sizes to choose from, a pack of 12 costs about $6. Buy them at leevalley.com.

Robert Welle, Carpenter

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MODERN BUILDING PRODUCTS

The BEST BACKER for TILE

Your tile project is only as good as its base. Here's how to choose from today's great DIY options.

by Jeff Gorton
editors@thefamilyhandyman.com

Decades ago, the standard base for most tile installations was a labor-intensive mortar bed that only a skilled tile setter could get right. Today, new backer boards, waterproofing methods and other tiling products allow a dedicated DIYer to create a long-lasting, trouble-free tile installation.

But choosing the right products can be confusing. In this article, we'll tell you the uses and pros and cons of various tile substrate products, so the next time you visit your local home center or tile shop, you'll have a better understanding of which products to pick for your project.

ART DIRECTION MARCIA ROEPKE • PHOTOGRAPHY HSP

BEDS, BOARDS & OTHER BACKERS

DRY-PACK MORTAR

This is the traditional tile backer. Felt paper is stapled to the floor and covered with expanded metal lath. Then cement, sand and water are mixed together to a crumbly consistency and floated over the lath to form a flat surface. Given the complexity, it's easy to see why even experienced tile setters use backer board when they can.

But a mortar bed does have advantages. There's no cutting or fitting of boards. And a mortar bed is good for leveling and flattening uneven or out-of-level floors, which are common in old houses. If you're handy with a trowel and understand how to set up and use screeds as a guide for leveling or forming the mortar, pouring a traditional mortar bed may be a good alternative to tile backer board, especially on uneven or sloping floors. An 80-lb. bag ($8) will cover about 10 sq. ft.

Cost per sq. ft.: $1.30
Pros: Levels and flattens uneven floors.
Cons: Requires skill to install.

SELF-LEVELING UNDERLAYMENT

If you have floors that are wavy or out of level, self-leveling underlayment is a great solution. It has many of the same advantages as a dry-pack mortar bed but doesn't require as much skill to install. You still use metal lath, but then mix bags of powder and pour the soupy mix onto the floor. It's also fast: Four or five hours after pouring self-leveling underlayment, you'll have a perfect tile base.

Cost per sq. ft.: $3.20
Pros: DIY friendly. Levels and flattens.
Cons: Expensive. Requires careful prep work.

But there are downsides. Using self-leveling underlayment takes careful prep work. You have to seal every little hole in the floor so the underlayment doesn't seep into spaces below. And most formulas harden very fast, so you have to plan carefully to mix and pour quickly. Self-leveling underlayment is also expensive. At home centers, a bag of self-leveling underlayment costs about $32. One 50-lb. bag will cover 10 to 12 sq. ft. at 1/2 in. thick. If you need a large quantity, see if you can negotiate a better price at a tile shop.

BEDS, BOARDS & OTHER BACKERS

CEMENT BOARD

Cement board is the most common and well-known backer board. It's readily available and relatively inexpensive (about $10 for a 3 x 5-ft. sheet). The 30-in. x 5-ft. and 3 x 5-ft. sheets are sized for efficient use around bathtubs and showers. The core isn't waterproof, but it can withstand getting wet without falling apart, so even if your waterproofing system leaks, the board will stay intact. On the downside, the boards are heavy, somewhat difficult to cut and can leave abrasive sandy crumbs that can damage tubs and shower bases if you're not careful.

Cement board is a good, reliable backer board that works well on both floors and walls. But most tile setters err on the side of caution and brush on a waterproofing membrane when the cement board is in wet areas like showers or tub surrounds.

Cost per sq. ft.: 65¢
Pros: Water-resistant core. Readily available.
Cons: Heavy and hard to cut.

LEARN FROM THE EXPERT

With decades of tiling experience, and a few hard-earned lessons along the way, Dean Sorem has learned a thing or two about what makes a perfect tile substrate. And he helps us with his expertise in this article.

FIBER CEMENT BOARD

Fiber cement board (HardieBacker is one brand) is a variation of cement board that's made from compressed cement and sand, reinforced with wood fibers throughout. Like cement board, the boards are heavy and hard to cut. And it's even more brittle than cement board, so you have to be extra careful to keep screws at least an inch from the edge to avoid breaking the board.

Fiber cement board is available in 1/4-in. and 1/2-in. thicknesses. The 1/4-in.-thick board is typically used on floors and countertops. A 3 x 5-ft. sheet costs about $12. Since fiber cement board is similar to regular cement board, it makes sense to choose the one that's cheaper or more readily available.

Cost per sq. ft.: 75¢
Pros: Moisture and mold resistant.
Cons: Heavy and difficult to cut.

FOAM BOARD

Foam-core tile backing board has two big advantages over other backer boards. First, it's super lightweight compared with the rest. A 1/2-in.-thick, 3 x 5-ft. sheet weighs just 7-1/2 lbs. compared with 45 lbs. for a similar size sheet of cement board. And second, since it's foam, the board is super easy to cut with just a utility knife. Another advantage is that the polyisocyanurate foam core is waterproof. You don't have to rely on a surface membrane or worry about the board failing if the core is exposed to water. However, you do still have to take care to waterproof the seams and the fastener penetrations to create a waterproof assembly.

The main drawback to foam-core board is the high cost (about $22 per sheet), twice that of other backer board. But considering the light weight, ease of installation and waterproof core, this backer board is a perfect fit for most DIY applications. GoBoard and KERDI-BOARD are two common brands of foam-core backer board.

Cost per sq. ft.: $1.45
Pros: Easy to cut and lightweight.
Cons: Expensive and may be hard to find.

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BEDS, BOARDS & OTHER BACKERS

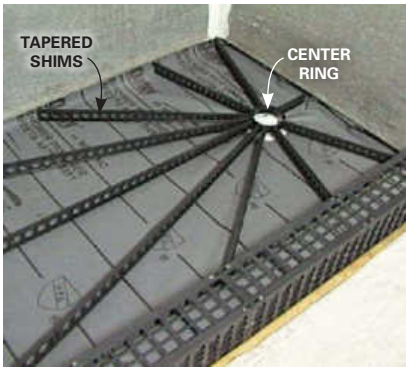
SHOWER FLOORS

Shower floors have always been one of the trickiest tile bases to install because they have to slope toward the drain and be completely waterproof. Traditionally, a waterproof membrane was placed under a sloping mortar bed, a process that required a lot of skill and experience. But thanks to new products, installing a shower floor is a job DIYers can tackle.

Cost per sq. ft.: Wide range depending on type.
Pros: Slope and drain connections are worked out for you.
Cons: Expensive compared with hand-troweled mortar.

Schluter makes a system that includes a preformed foam floor, drain, curbs and waterproof membrane. Starting at about $500, it's expensive, but it allows even a DIYer to create a perfect, waterproof shower floor without having to pour a sloping mortar bed. Or for a similar price, you can buy a rigid plastic shower base with a surface that's designed to tile over.

Finally, if you would prefer to pour a traditional dry-pack mortar bed, Mark E Industries sells a Quick-Pitch Kit (**photo right**; starting at about $40), which contains tapered plastic shims that act as screeds, allowing you to easily get just the right slope on the floor.



MARK E

Quick-Pitch Kit

GYPSUM BOARD

Water-resistant gypsum board, or "green board," was used in the past as a tile backer but is no longer recommended, mainly because better products are available. Glass mat gypsum board is a better choice. The sheets are made from water-resistant silicone-treated gypsum, reinforced on both sides by fiberglass mats. DensShield is one common brand. It's easier to cut than cement board, and it's mold resistant and has a built-in moisture barrier. Dean, our tile consultant, says glass mat backer board is his first choice for ease of installation and cost and because his helpers like it. DensShield costs about $10 for a 2.7 x 5-ft. sheet.

Cost per sq. ft.: 65¢
Pros: Easy to cut and install.
Cons: Requires careful waterproofing.

DIMPLE MAT

If you're looking for a way to minimize height buildup and eliminate a large level difference at thresholds, a mat product is a good solution. Ditra is a 1/8-in.-thick polyethylene membrane with a layer of anchoring fleece on the underside and a grid of square cavities on top. Installation is simple. You trowel a layer of thin-set adhesive on the floor and embed the mat in it. Then you fill the cavities with thin-set to create a strong, waterproof tile backer that also functions as an uncoupling membrane. The completed assembly takes the place of more traditional backer board when installed over 3/4-in. wood subfloors. A 3 x 3 x 16.4-ft. roll costs about $110. SpiderWeb II uncoupling mat is a similar product.

Cost per sq. ft.: $1.10
Pros: Thin. Crack-isolating. Can be waterproof.
Cons: A little more expensive than some boards.

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DOES IT HAVE TO BE WATERPROOF?

Tile and grout by themselves are not waterproof. Moisture can wick through grout, or get behind the tile at openings for faucets and other fixtures. This isn't an issue for kitchen backsplashes and other places that aren't subjected to a lot of water. However, it can be a real problem around showers and tubs. If you need a waterproof base for tile, you have three options: You can choose a backer that's waterproof, apply a brush-on waterproofing coating or use a waterproofing membrane.

WATERPROOF BOARD

Waterproof backer board saves you the hassle of applying a separate waterproofing liquid or membrane, but you'll still have to waterproof the seams and fasteners according to the manufacturer's instructions.

Using waterproof backer boards usually costs more than coating your installation with a liquid waterproofing membrane. But there may be other factors like light weight that tilt the balance in favor of waterproof board.

LIQUID WATERPROOFING MEMBRANE

Liquid waterproofing membranes like RedGard or AquaDefense can be applied by trowel, brush or roller. These products dry to form a flexible waterproof membrane that also functions as a crack-isolating membrane. Common uses include waterproofing cement or gypsum backer boards, seams and fasteners on backer board installations, and shower walls.

Applying liquid waterproofing is a very easy way to create a waterproof membrane. One gallon of a popular brand costs about $50 and will make a waterproof barrier over about 40 sq. ft. If there's a downside to a brush-on waterproofing membrane, it's that you have to be careful to apply the right amount so that the dry layer will be thick enough to be effective. You can accomplish this by following the instructions exactly. In areas with a lot of corners, niches or built-in benches or other features, this type of waterproofing is easier to install and less expensive than a fabric membrane.

WATERPROOF MEMBRANE

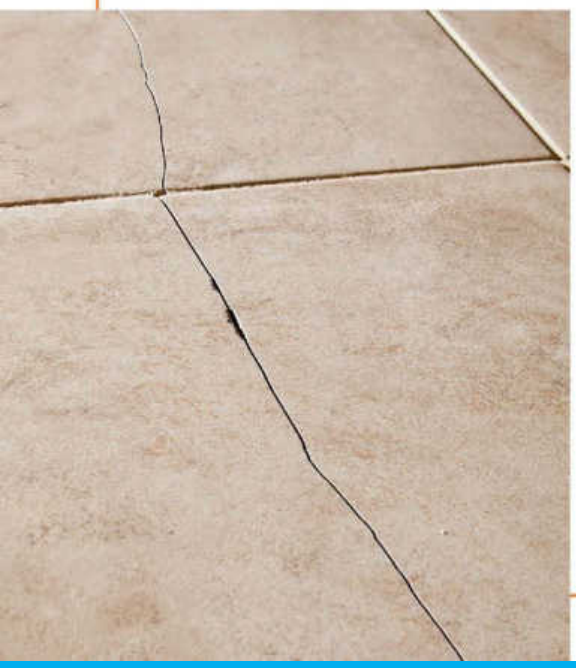
Waterproof membrane is a handy product for shower floors, and it's so reliable that it can even be applied over ordinary drywall to create a waterproof tile backer.

Waterproof membrane is available in rolls and is installed by embedding it in a layer of thin-set mortar. The membrane isn't cheap, though. A 54-sq.-ft. roll of a common brand costs about $100. Dean likes to use a waterproof membrane on shower floors, where he can overlap it up the wall to ensure a waterproof joint at the intersection of the floor and wall. Then to save time and money, he switches to liquid waterproofing for the walls.

Waterproof membrane can be applied over ordinary drywall to create a waterproof tile backer.

DO YOU NEED CRACK ISOLATION?

When you're looking for tile substrates, you may see products labeled as "crack-isolating" or "uncoupling" and wonder what that means and whether you should worry about it. The idea behind uncoupling or crack isolation is that in some cases, the structure that you tile over should be allowed to move independently of the tile. The most common example is a concrete floor with cracks in it. Concrete itself is a great base for tile. But if you were to adhere tile directly to cracked concrete, and the concrete moved a little at the crack, the tile would crack. But installing an uncoupling membrane or crack-isolating product over the concrete allows the concrete to move a little without cracking the tile.



The structure that you tile over should be allowed to move independently of the tile.

Another common use for a crack-isolating or uncoupling membrane is to prevent cracking in tile installed over in-floor heat systems. The heating and cooling cause the substrate to expand and contract more than normal, and isolating this movement protects the tile. Crack-isolating products are available in rolls, mats and liquid form. Some products also perform other functions like waterproofing, so when choosing, match the features to your requirements.

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BY MARK PETERSEN editors@thefamilyhandyman.com

Deck screws

Has it been a while since you built your last deck? Did you fasten the wooden deck boards with nails or Phillips-head screws? Did you nail on joist hangers? Those days are over, my friend.

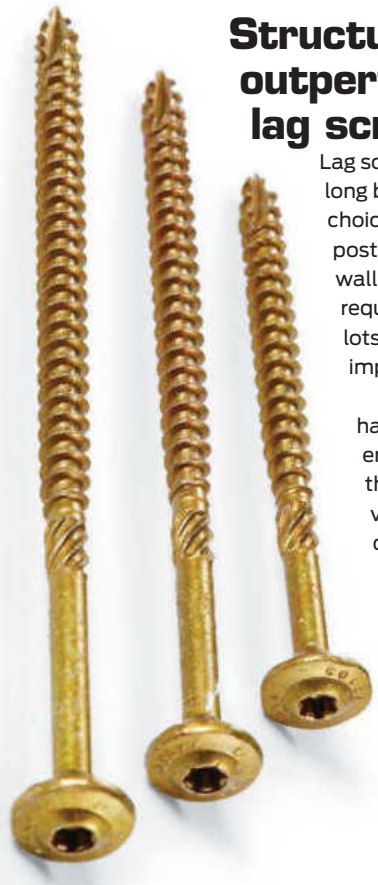
We met with some deck pros, who gave us the lowdown on the new screws they're using to hang ledgers, secure posts and fasten metal connectors. They also gave us terrific insight into which deck screws and fastening systems they preferred for wood and synthetic deck boards. We guarantee you'll find something here that will help you build your next deck faster and stronger—and make it look like a million bucks.

MEET THE EXPERTS

Bob Januik and Matt Norden have built thousands of decks. The fastener shelf in their warehouse is stacked with dozens of fasteners that didn't even exist when they started Precision Decks 20 years ago. They appreciate the improvements in the deck-building industry, and they know their customers love all the new options.

Hide the screws

Hidden fastening systems are great, but there's no more secure way to fasten a deck board than by screwing directly through the board into the framing. That's why the Cortex Hidden Fastening System is our experts' favorite. The boards are held down with composite deck screws that countersink themselves. The holes are then filled with plugs cut from the exact material the deck boards are made from, making them virtually disappear. A box of 375 costs about $125 at home centers.



Structural screws outperform lag screws

Lag screws and washers have long been the fastener of choice for securing joists to posts and ledger boards to walls. Lags work fine, but they require a predrilled hole and lots of hand wrenching or an impact wrench.

Modern structural screws have auger stips and highly engineered threads that rip through wood fibers with very little force and no predrilling. Many can be installed with cordless drivers. Structural screws have wide heads that work like washers and are made of steel with tremendous shear strength. The ones shown here are made by GRK.

Upgrade to composite deck screws

These are the features to look for in the screws you use to secure your composite, capped composite and PVC deck boards:

- An **auger tip** bores out the material as the screw drives through the material.
- **Reverse threads** help secure the deck board to the framing and pull down the shavings so they don't get trapped under the head and cause mushrooming.
- An **undercutting head** slices through the surface so the screw can be sunk flush or countersunk without distorting the surface.
- A **star or hex head** has six points of contact instead of four like a Phillips or square-drive, helping you avoid stripping the screw.

Our experts prefer the TrapEase 3 screw shown here. It uses a proprietary Torx drive system called "TORX ttap," which consists of a button at the bottom of the driver that fits into a recess in the screw head. It ensures that the bit is always centered in the screw head, almost eliminating stripping and cam-out. These screws come in a box with a lid that functions as a board spacer and screw alignment guide. A box of 350 FastenMaster TrapEase3 screws costs about $45. They're available in 17 colors at some home centers, lumberyards and online retailers.

It's a screw *and* a bolt

Are you a nuts-and-bolts kind of deck builder? Don't trust structural screws on your deck frame?

Well, here's a product that combines the best of both worlds. The ThruLOK structural screw can be driven into lumber without a pre-drilled hole. It also has a special nut that threads onto the end of the screw/bolt, sandwiching the framing components together. It's perfect for handrail posts, which can be subjected to extreme lateral force. ThruLOK screws cost about $2.50 each at The Home Depot.

Hidden deck board fasteners

Here's our advice for choosing among the many hidden fasteners available:

- Pick a fastener that can be used with grooved boards. Some hidden fasteners don't work with deck boards that have a groove on the sides.
- You must use a hidden fastener that's approved for the type of decking you're going to use.
- Choose hidden fasteners that allow you to remove an individual board that has been damaged. Some hidden fasteners require removal of all the boards installed after the one that needs replacing.
- Look for topside installation. Some hidden fasteners are installed on the bottom of the deck boards. This is a problem for decks that are high in the air or low to the ground.

Be prepared for stripped screws

If you drive in hundreds of screws, you're bound to strip out a few of them. Pick up a screw extractor before you get started. All you need to do is smooth out the inside of the screw head with the burnishing end of the bit, then flip the bit around and back out the screw. As the bit turns counterclockwise, it digs down into the screw head, creating a very strong connection. The one shown here is an Alden Grabit, but there are other brands. A set of two costs $13 at Lowe's.

Buy screws compatible with treated lumber

The preservatives in pressure-treated lumber cause many metals to corrode. If you're buying screws labeled "deck screws," they're probably compatible with your framing lumber. But if you don't see "ACQ [Alkaline Copper Quaternary] compatible" on the package, don't buy them. Stainless steel is the least corrosive material for screws, but stainless steel screw heads are softer and more prone to stripping, so they work best with predrilled holes (see "A Perfect Hole Every Time" at right).

A perfect hole every time

When working with rock-hard decking materials like ipe, our experts predrill holes in the wood with Starborn Industries' Smart-Bit predrilling and countersinking tool. It has a rubber face and a free-spinning collar, so it won't damage the surface of the wood. Starborn makes Headcote colored stainless steel trim-head screws that work with the bit, but any No. 7 trim-head stainless screw will work. This bit comes in handy for general woodworking projects as well. Smart-Bit countersinking tools are available at decksdirect.com and other online retailers for about $20.

ART DIRECTION **VERN JOHNSON** • PHOTOGRAPHY **PAUL NELSON UNLESS NOTED**

Screw + nail = scrail

That's right—a screw that's driven in like a nail. These scrails work with the Tiger Claw hidden fastener system, which is arguably the fastest deck installation system available. A clip is slid onto the end of a special pneumatic gun. The clip is then inserted into the side groove of a deck board and fastened to the joist with a scrail. The scrail holds as well as a ring-shank nail but can be removed like a screw if a damaged board needs to be replaced. Pretty cool system, huh? But before you get too lathered up over it, know that the gun costs $300.

Connector screws work better

Most joist hangers and other metal connectors require a lot of fasteners to hold them in place. These connectors are often in awkward locations with little or no room to swing a hammer. To avoid smashing your fingers, install your connectors with screws instead of nails. A pack of 100 of these Simpson Strong-Tie Connectors costs about $14 at lumberyards and home centers.

CAMO (X2)

The perfect option for wet wood

Here's a cool, inexpensive tool for fastening wood deck boards. In addition to being fast and easy to use, the Camo Marksman Edge Tool drives the screw into the top corners of the boards, which makes the heads hardly noticeable. This is a great feature because it's not easy to hide fasteners on wood you want to install without a gap (wet treated pine and other soft woods like cedar shrink and create a gap after they dry).

The Marksman Edge Tool attaches to any drill. All you need to do is slide a screw up into the tool, hook the tool onto the edge of the board and drive the screw home. The pro version has a long handle and collated nails for super-fast, stand-up installation. The Marksman Edge Tool costs $22 at The Home Depot. A box of 700 screws costs $50. Camo makes similar tools for synthetic decking as well.

Wood deck screws

These wood deck screws work great for fastening wooden deck boards and are economical as well. They are the ones that most closely resemble the deck screws of old, but a closer look reveals the improvements. These DeckMate screws feature a Torx drive head, an auger tip, cut points on the treads to reduce resistance, and cutting nibs under the head that act like a countersink bit. A 5-lb. box of 393 costs $30 at The Home Depot.

Pull off a better paint job with just one pull.

Handy HINTS®

FROM OUR READERS handyhints@thefamilyhandyman.com

NO-TRIM WALL BORDER

If you're building a fence or a retaining wall, set a course of protruding stones in the soil beneath it. That way, your mower can cut all the grass—no hand trimming needed. The stones should protrude about 4 in. from the wall and stand at least an inch above the soil so grass doesn't creep over them. You'll still have to pull out grass from between the stones occasionally.

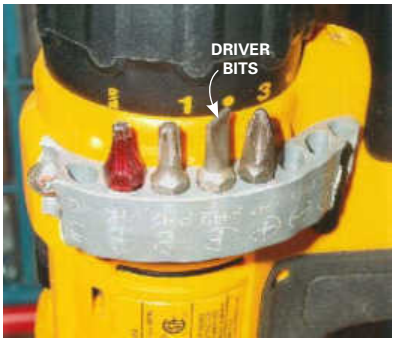
Gabriel Castillo

GET $100 FOR YOUR HANDY HINT! SEE P. 4 FOR DETAILS.

Simple sanding block

Not happy with the selection of sanding blocks at the hardware store, I made a few of my own from hardwood scraps left over from a woodworking project. I cut each one to 3/4 in. x 1-1/2 in. x 4-1/2 in.—which is just the right size to wrap a quarter sheet of sandpaper around. And the "kerf" cut helps hold the sandpaper in place until I'm ready to change it.

Tim Olaerts



Onboard bit storage

Tired of constantly trying to find the right driver bit for driving screws, I came up with a way to keep the ones I use the most close at hand. I took one of those rubber strips that come packaged with some driver bit assortments, cut it to length, and attached it to my cordless drill/driver using two of the existing motor housing screws.

Nicolaas Dorhout

EDITOR JASON WHITE • ART DIRECTION MARCIA ROEPKE • PHOTOGRAPHY TOM FENENGA and HSP

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DIY TIP GENIUS

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Pullout-faucet fix

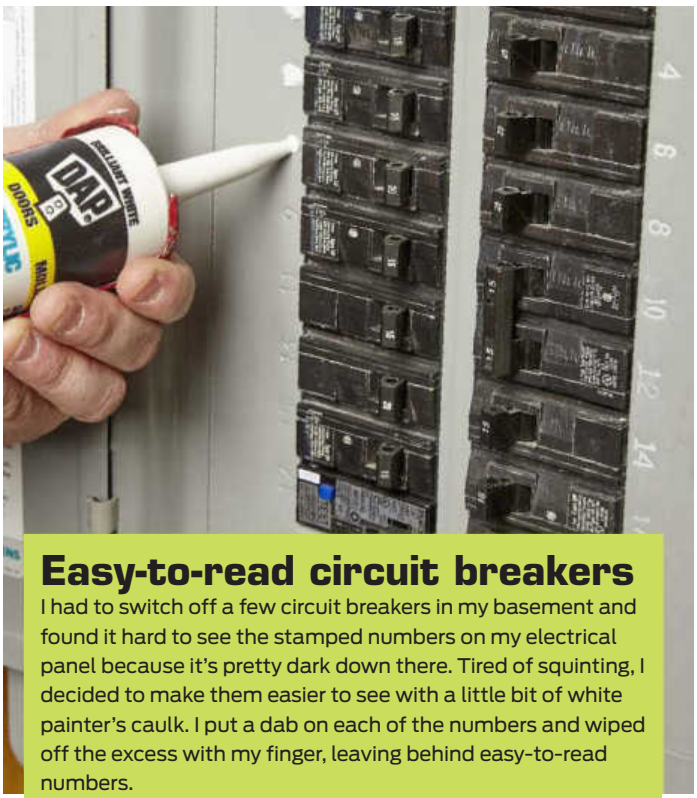
My kitchen sink has a pullout faucet that sometimes won't stay put. To give the hose more weight underneath the sink, I grabbed an old padlock and attached it right next to the existing weight. Worked like a charm!

Stuart Ross

TARP TRAILER

With a big plastic tarp, you can easily drag leaves, branches or mulch around your yard to wherever you need it. A 9 x 12-ft. tarp costs about $9 at home centers and hardware stores.

Daniel Rodman



Easy-to-read circuit breakers

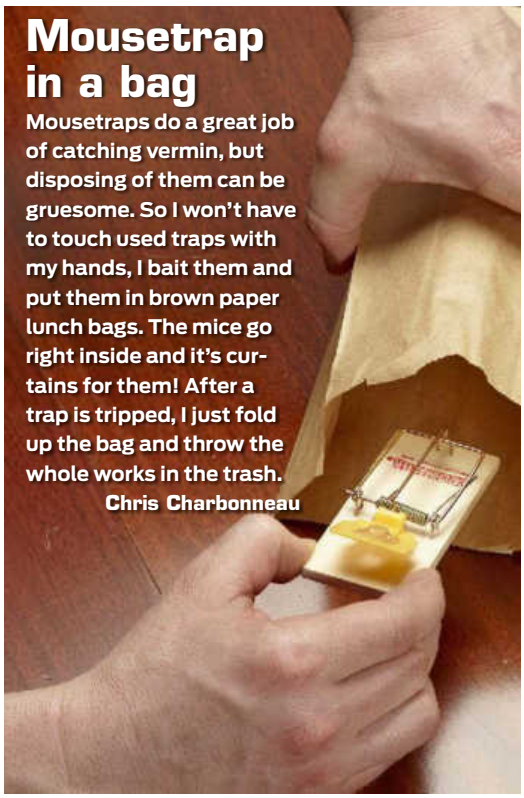
I had to switch off a few circuit breakers in my basement and found it hard to see the stamped numbers on my electrical panel because it's pretty dark down there. Tired of squinting, I decided to make them easier to see with a little bit of white painter's caulk. I put a dab on each of the numbers and wiped off the excess with my finger, leaving behind easy-to-read numbers.

Casey Overland

Mousetrap in a bag

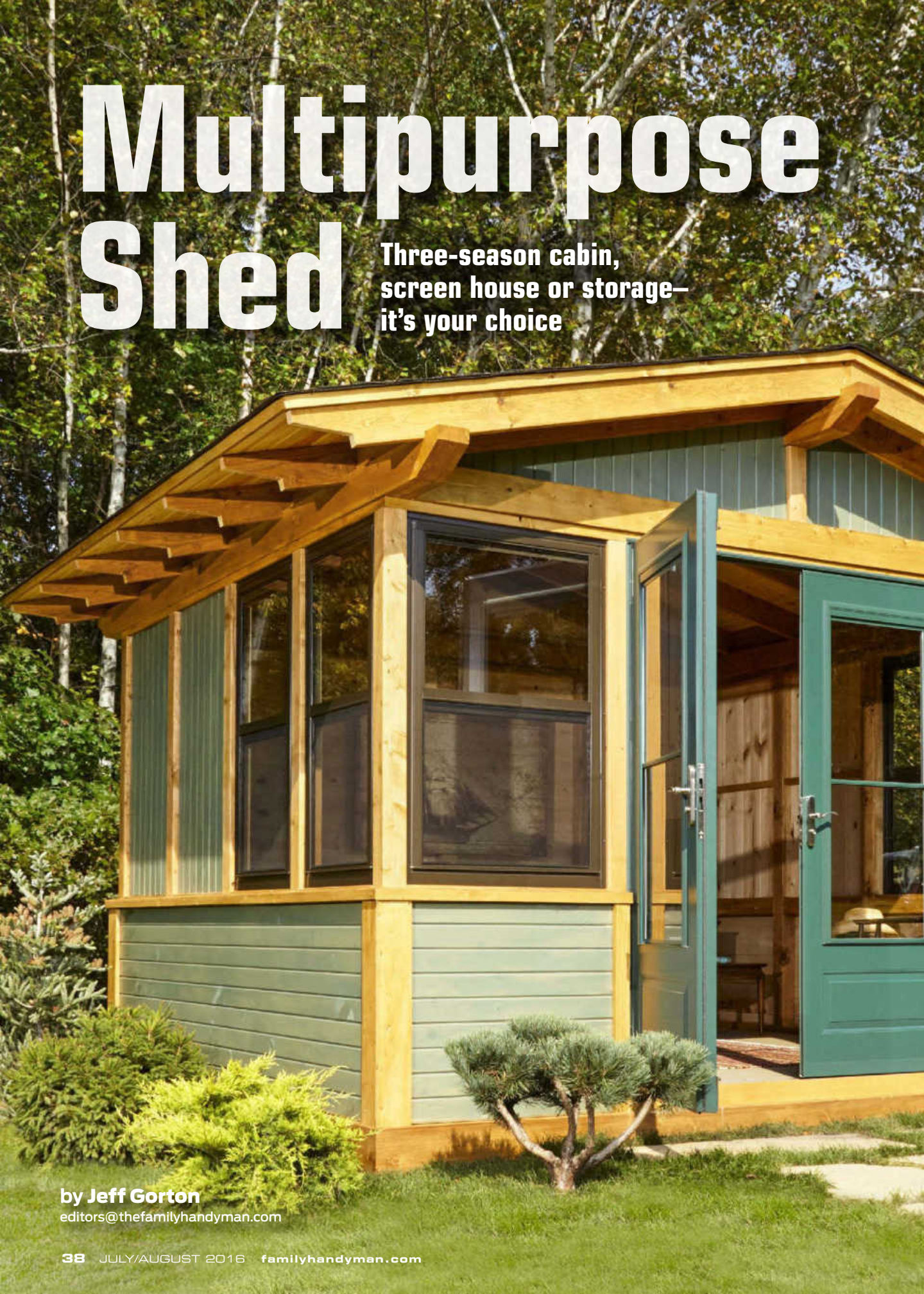
Mousetraps do a great job of catching vermin, but disposing of them can be gruesome. So I won't have to touch used traps with my hands, I bait them and put them in brown paper lunch bags. The mice go right inside and it's curtains for them! After a trap is tripped, I just fold up the bag and throw the whole works in the trash.

Chris Charbonneau



Multipurpose Shed

Three-season cabin, screen house or storage– it's your choice



by Jeff Gorton
editors@thefamilyhandyman.com

We designed this year's shed with flexibility in mind. The version we show here has six windows and works perfectly as a three-season cabin. It also feels like a cabin, with its knotty wood interior, exposed beams and abundant light and air.

But you can easily replace the windows with screens to create an airy screen house, or cover the entire shed with siding for a secure storage space. And you can change your mind later, and go from screen house to storage shed or vice versa! We'll show you how to build the shed with windows, but you can customize the shed to match your lifestyle.

WHAT IT TAKES

TIME: Five or six weekends

COST: About $4,000

SKILL LEVEL: Intermediate carpentry skills

TOOLS: Standard carpentry tools, circular saw, drill. A table saw, miter saw and trim nailer will speed up the work.

MAKE IT YOUR OWN

The widely spaced 4x4 supports allow you to customize this shed however you like. Make it a three-season cabin, a screen house or a completely enclosed storage shed.

FILL THE OPENINGS WITH SIDING TO MAKE IT A SHED

INSTALL WINDOWS TO MAKE IT A THREE-SEASON CABIN

INSTALL SCREENS TO MAKE IT A SCREEN HOUSE

For a Materials List and detailed drawings on framing, siding and trim, go to familyhandyman.com/2016shed

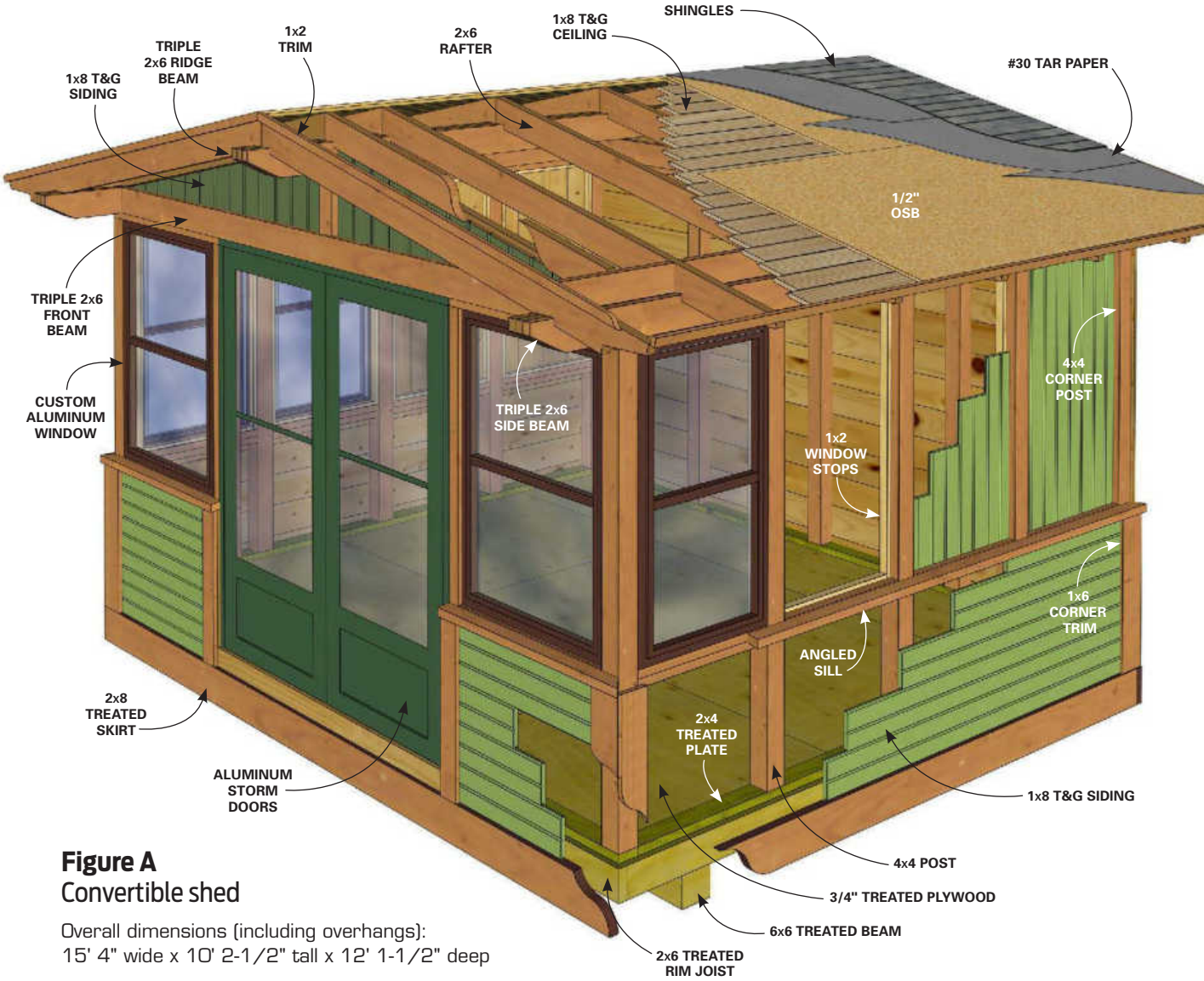


Figure A
Convertible shed

Overall dimensions (including overhangs):
15' 4" wide x 10' 2-1/2" tall x 12' 1-1/2" deep

MEET THE EXPERT

Jeff Gorton has been designing and building sheds for the magazine for more than a decade. He's applied that knowledge and experience to make this year's shed one of the best yet.

Money, time and tools

You'll find all the lumber, siding and trim to build this shed at home centers or lumberyards. Be picky about the lumber, though. Choose straight 4x4s that aren't twisted or cracked. The same goes for the 2x6s. It's easier to build straight beams with straight material.

We ordered the storm doors at a home center, and ordered custom-size storm windows from a window company. The materials for this shed cost us about $4,000. This includes top-end windows that cost us about $200 each and $700 storm doors. You could reduce the cost with less expensive windows and by building your own doors.

We tried to keep the shed design simple so that even beginning carpenters could successfully build it. Even so, there are a few challenging parts, like making sure the window openings are perfectly square and building the hand-framed roof. But if you study the plans and follow our pointers, I'm sure your shed will turn out great.

Getting started

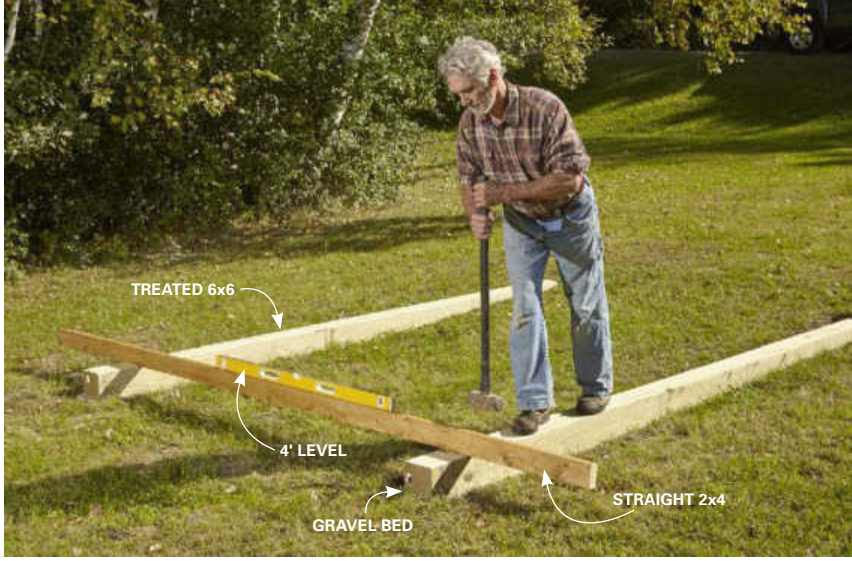
In most areas, sheds 120 sq. ft. or smaller do not require a permit to build, but check with your local building department to be sure. Also ask if there are rules about where your shed can be located on the lot.

A few days before you plan to dig, call 811 for instructions on how to have buried utility lines marked.

Build the floor

We like the simplicity of resting the shed on treated 6x6s, but a concrete slab is a great alternative. And if you pour a slab, you don't have to build the floor. If the site isn't level, you could also support the joists on posts and beams.

Start by laying out the perimeter of the shed, either with stakes and a string line, or with a rectangle built with 2x4s to

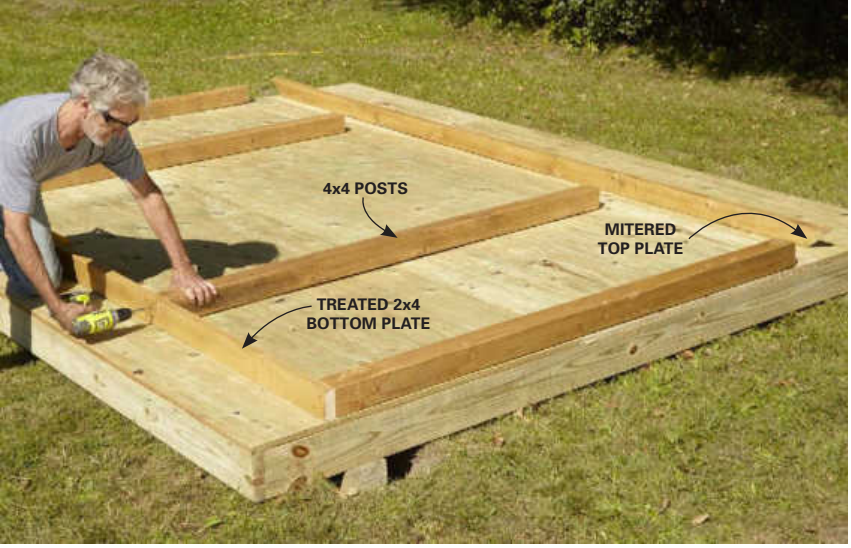


1 LEVEL THE 6x6s
Rest the treated 6x6s on beds of gravel. Use a straight board and a level to make sure the 6x6s are level with each other. Adjust the heights by tamping down with a sledge or other heavy object.

2 SQUARE THE JOISTS
Measure diagonally to square the joists. Adjust the joists until the diagonal measurements are equal.

3 INSTALL THE PLYWOOD FLOOR
Glue and nail treated plywood over the joists. Stagger the seams.

ART DIRECTION **VERN JOHNSON** • PHOTOGRAPHY **TOM FENENGA** • ILLUSTRATION **JEFF GORTON**



4 BUILD THE FRONT WALL
Mark the 4x4 locations on the mitered top plate and treated bottom plate. Drive screws through the plates into the 4x4s to hold them in place. Cut out the bottom plate in the door opening after all the walls are up.

5 STAND THE FRONT WALL
Attach temporary braces to the top of the wall. Lift the wall and align the bottom plate with the chalk line and screw it down. Secure the braces to temporarily support the wall.

6 PLUMB AND BRACE THE FRONT WALL
Use a level to make sure the end 4x4s are perfectly plumb. Then screw a diagonal brace to the inside to hold the wall square.

represent the outside edges of the 10 x 12-ft. floor. Now measure in 14-3/4 in. from the long sides and drive stakes to mark the center of the trenches.

Dig trenches about 12 in. wide and about 10 in. below where you want the bottom edge of the joists to end up. Pour 5 in. of gravel into the trenches and level it off. Make sure the gravel in both trenches is at the same level. Then cut the 6x6s to 12 ft. long and set them in the trenches. Measure to make sure the 6x6s are parallel. Then measure diagonally from the ends to make sure they're square. The diagonal measurements should be equal.

Finally, tamp the 6x6s with a sledge to level them (**Photo 1**). This is the critical part, since any deviation from level will cause problems later. So check and double-check until the 6x6s are level from end to end, and level with each other.

Now you're ready to build the floor. Start by cutting the 12-ft.-long rim joists for the front and back and marking the joist locations 16 in. on center. Assemble the perimeter frame on top of the 6x6s (**Photo 2** and **Figure B** online). Then fill in the remaining joists. When you're done, use a taut string line or sight down the 12-ft. rim joist to make sure it's straight. Then drive toenails through the joists into the 6x6s. Finish up by nailing the 3/4-in. treated plywood to the joists (**Photo 3**).

Construct the walls

The walls of this shed are simple—just 2x4 plates with 4x4s in between. We spaced the 4x4s evenly along the sides and back. The front opening is sized for a pair of 32-in.-wide storm doors in a single frame. Double-check the door opening dimension to make sure it will work with the doors you order. Since it would be difficult to stain the posts and roof framing after the tongue-and-groove siding is installed, we prefinished all these parts.

Start by chalking lines on the floor to indicate the inside edges of the walls. These lines provide a reference for straightening the bottom plate of the walls after the walls are standing. Cut bottom plates from treated 2x4s and top plates from untreated lumber. Arrange the plates along the chalk lines and mark them (**Figure C** online).

Since there is no double top plate to tie the walls together, cut 45-degree angles on the ends of the top plates so they can be joined over the corner posts (**Photo 7**).

Arrange the 4x4s between the plates, line them up with the marks, and attach the plates to them with 3-in. screws. When you're building the walls, be careful to keep the space between the posts equal according to the plans. You'll be glad you did when it comes time to install the rough sills, windows and siding that fit between them. We used weather-resistant screws for most of the assembly on this shed, but you can substitute galvanized nails.

Build and stand the front wall and support it with temporary 2x4 braces (**Photos 4 and 5**; **Figure D** online). Use a long level to plumb the front wall. Then screw on a diagonal 2x4 brace to hold it plumb (**Photo 6**). Build, stand and brace the remaining walls (**Figure E** online). Connect the mitered top plates over the corner studs with screws (**Photo 7**). Before moving on, double-check all the walls to make sure the corners are plumb and the walls are well braced.

Install the beams

The rafters are supported by triple 2x6 beams that add a rustic timber-frame look to the building. Start by choosing straight 2x6s and cutting the angled ends using **Figure F** (online) as a guide. When you assemble the beams, choose the best-looking faces for the exposed sides.

Apply three beads of construction adhesive the length of the 2x6s and sandwich them together. Draw them tight together with screws. We used a belt sander to flush up the angled end cuts after the beams were assembled. **Photo 8** shows how to install the side beams. Measure between the side beams to double-check the front and back beam lengths before you cut the 2x6s. **Photo 9** shows installing the front beam.

Cut posts (**Figure F** online) and attach them to the center of the front and back beams with angled screws. Then position the ridge beam on the posts and attach it by driving 8-in. construction screws down through the beam into the posts (**Photo 10**).

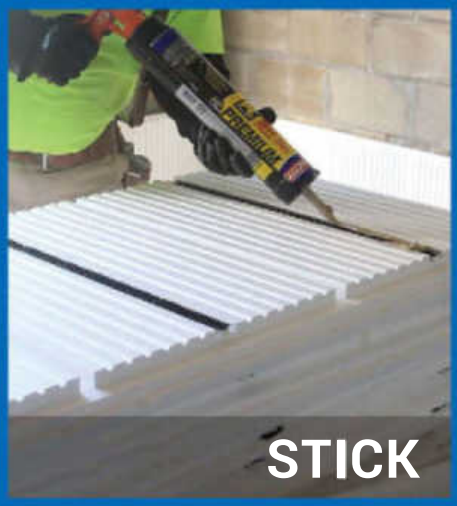
Cut and install the rafters

The 2x6 rafters have small notches called "bird's-mouths" cut in them that allow the rafters to sit firmly on the beams. They also have a decorative angle cut on the tails. Use the dimensions from **Figure G** online to mark the cuts on a

7 JOIN THE TOP PLATES
Drive screws through the mitered top plates into the corner 4x4s.

8 BUILD AND INSTALL THE SIDE BEAMS
Glue and screw three 2x6s together to build the beam. Center the beam assembly over the side wall plate, making sure the front and back overhangs are equal. Screw through the plate into the beam.

9 ADD BEAMS OVER THE FRONT AND BACK WALLS
Build beams for the front and back and set them in place between the side beams. Use long construction screws to hold the beams together at the corners.



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10 SET THE RIDGE BEAM
Rest the center beam on 4x4 posts that have been toe-screwed to the front and back beams. Drive long construction screws down through the beam into the posts to hold them in place.

11 CUT THE RAFTERS
Cut bird's-mouth notches for the beams and decorative ends on the rafters. Use a handsaw to finish the cuts.

12 INSTALL THE RAFTERS
Mark the ridge beam and the side beams for the rafter locations. Line up the rafters with the marks and attach them with angled screws.

straight 2x6. Cut along the lines with a circular saw, and finish the inside corners on the bird's-mouths and rafter tails with a handsaw (**Photo 11**).

Make two rafters from the plans. Then check the fit by holding the pair of rafters up on the beams to make sure the bird's-mouths are tight to the beams and the tops of the rafters meet accurately. Make any adjustments needed, and when you have a rafter that fits perfectly, mark it with a "P" to indicate that it's a pattern. Use the pattern rafter to mark the rest of the rafters. Cut the rafters and prefinish them with your choice of sealer, stain or paint.

Using **Figure H** online as a guide, mark the rafter locations on the tops of the side and ridge beams. Notice that the four rafters over the front and back walls are cut short to butt into the rafter blocking. Set pairs of rafters in place and attach them with 3-in. screws (**Photo 12**). You can move the ridge beam slightly from side to side if necessary for a good rafter fit.

Rip a bevel on one edge of two 12-ft. 2x6s to use as blocking between the rafters (**Figure H** online). Cut the beveled 2x6s to fit between the rafters, over the outside beams, and attach them with screws.

Cover the rafters

We nailed 1x8 tongue-and-groove boards over the rafters to create an attractive ceiling in the shed. If you're using the shed only for storage or don't care about the ceiling finish, you can skip this step and simply nail sheets of plywood or oriented strand board (OSB) to the rafters. If you want a finish on the tongue-and-groove ceiling, it's a lot easier to apply it before you install the boards.

Photo 13 shows how to install the tongue-and-groove (T&G) boards. When you're about halfway to the ridge, measure from the tongue to the top of a rafter on both the front and back of the roof. If the measurements aren't equal, make fine adjustments to the board spacing, spread over several rows, until they're equal. This will ensure that the final board is a consistent width.

When you're done installing the boards, add a layer of 1/2-in. OSB on

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13 COVER THE RAFTERS
First add blocking between the rafters, above the side beams. Then nail 1x8 tongue-and-groove boards to the rafters.

14 ADD A LAYER OF OSB
Nail OSB (oriented strand board) to the rafters. The extra layer prevents the shingle nails from penetrating the tongue-and-groove ceiling boards.

15 ADD DOUBLE 2x4 SILLS
Cut a pair of 2x4s to use as supports for the sills as you toe-screw them to the posts. Add double 2x4 sills at each opening.

16 INSTALL THE ANGLED SILL
Rip sill material from 2x4s using a table saw. The front and back edges are beveled, allowing the sill to slope down and shed water. Attach the sill with trim-head screws or galvanized casing nails.

17 NAIL ON THE SIDING
Starting at the bottom, cover the area under the openings, as well as the back wall, with tongue-and-groove boards. To add rigidity to the shed, screw the siding to the posts at the corners. The screws will be hidden by corner trim boards.

top (**Photo 14**). The added thickness is necessary to prevent the shingle nails from poking through the tongue-and-groove ceiling. Finish up by nailing a 1x2 trim piece around the perimeter of the roof.

Finish the exterior

We designed this shed to have window openings on the sides and front, and a solid back wall. But you can easily add or delete openings by changing the location of the rough sills. **Photo 15** shows how to use a pair of 2x4 spacers to keep the rough sills at a consistent height.

We added an angled sill to help shed water and cover the top edge of the siding (**Photo 16**). See **Figure N** online for the dimensions and bevel required. Position the sill 1/4 in. below the top of the rough sills. Extend the sill 1-3/4 in. onto the 4x4 on each side of the door opening, and wrap the sill 4 in. around the back corner.

Prepare the openings for windows or siding by nailing 1x2 stops to the top, bottom and sides of the openings. Set the stops 1-3/4 in. back from the face of the 4x4 openings. You'll attach your choice of windows, siding or screens to these stops.

Our windows are from Allied Aluminum (alliedaluminumwindows.com). But any storm window will work. Carefully measure and record the width and height of each opening that will receive a window. Use these

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18 INSTALL THE WINDOWS
Nail 1x2 stops around the inside of each opening to provide support for the windows. Drive screws through the holes in the windows into the stops to hold the windows in place.

19 MOUNT THE DOORS
Install double doors according to the instructions provided with the doors.

20 SHINGLE THE ROOF
Staple tar paper to the OSB. Then follow the instructions on the shingle package for spacing and nailing the shingles.

dimensions to order windows. Your supplier will size the windows to fit your openings.

Install the tongue-and-groove siding

Measure up 3-1/2 in. from the bottom of the treated joists and chalk lines around the shed to indicate the bottom of the first row of siding. Nail the first row of siding to the joists with the tongue facing up. If you don't want nail holes to show, nail the remaining courses through the tongues (**Photo 17**). Cut the top course to fit under the sill.

To add rigidity to the shed, screw the siding to the corner posts, using two screws in each piece. Place the screws where they will be hidden by the corner board trim. Finish the siding by adding the corner boards, and the trim boards on both sides of the front door opening (**Figures L, M and N** online).

For more privacy, we filled four of the openings with vertical tongue-and-groove boards. But you could add more windows in these locations if you prefer.

Add 2x4 backing (**Figure J** online) and tongue-and-groove siding in the gable ends on the front and back of the shed.

Mount the windows and doors

The Allied Aluminum windows we used included expandable U-shape channels on all sides. We tipped the windows into the openings, slid the channels until they were tight to the opening, and drove screws into the stops to hold the windows in place (**Photo 18**). If your windows are different, follow the included instructions.

We ordered a pair of aluminum storm doors set up as French doors. There were a lot of parts, and the installation was a bit trickier than for a single storm door. Follow the instructions included with your door and plan to spend several hours installing the doors (**Photo 19**). The aluminum door frames mount to the face of the 4x4s on the sides of the opening, and the 2x4 along the top.

Finishing up

Staple tar paper to the roof and cover it with shingles (**Photo 20**). Follow the instructions on the shingle package for the correct shingle layout and nailing pattern.

Since we prefinished the posts, beams and tongue-and-groove ceiling, the exterior tongue-and-groove siding was the only thing left to finish. For this we used a top-quality semitransparent stain.

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3-Season Planter

Enjoy lush, blooming plants spring, summer and fall

This planter has a secret inside.

It's lined with an ordinary plastic planter box, the kind you can get at any home or garden center for about $10. That means you can lift out one plastic box and drop in another, instantly swapping plants. You might, for example, start the growing season with spring bloomers in your planter while the other plants grow elsewhere. When the spring plants are past their prime, you can drop in the next set of plants.

The inner plastic box has practical advantages too. It separates damp soil from the wooden planter, which protects the wood from moisture problems like rot and peeling paint. And since this planter is really just a decorative container for the plastic pot, it's much easier to build than a typical planter. If you use cedar lumber, this project will cost you about $100. Built from pressure-treated or untreated pine, it will cost about $80.

by Gary Wentz
editors@thefamilyhandyman.com

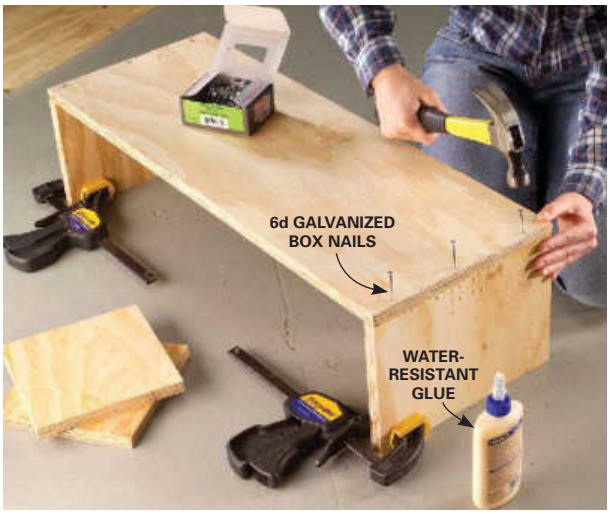
PLASTIC PLANTERS ARE PERFECT

Plastic planters or liners keep wet dirt away from wooden parts. And because plastic containers come in various shapes and sizes, you have a lot of freedom in designing your planter.

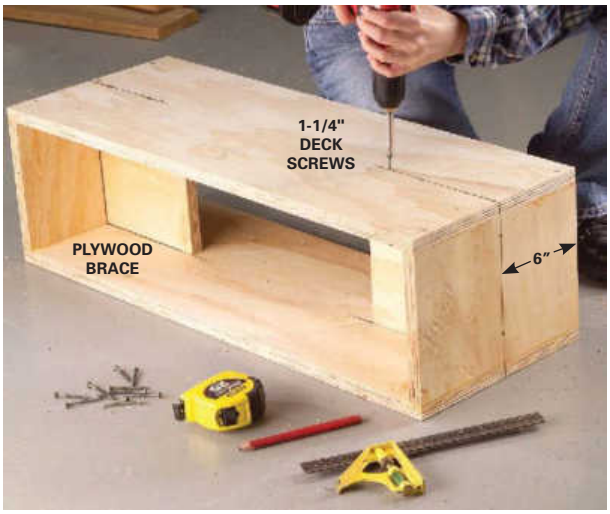
CUSTOMIZE IT!

This planter is basically a plywood box with legs that fit over each corner. That simple structure allows you to easily change the size, shape or look while following the same building steps. For example, you can cover the box with siding or wood shingles. You can coat your planter with paint, stain or a clear finish. The plans for the two examples shown here are on pp. 58 and 59.

ART DIRECTION BECKY PFLUGER • PHOTOGRAPHY BILL ZUEHLKE • TECHNICAL ART FRANK ROHRBACH III

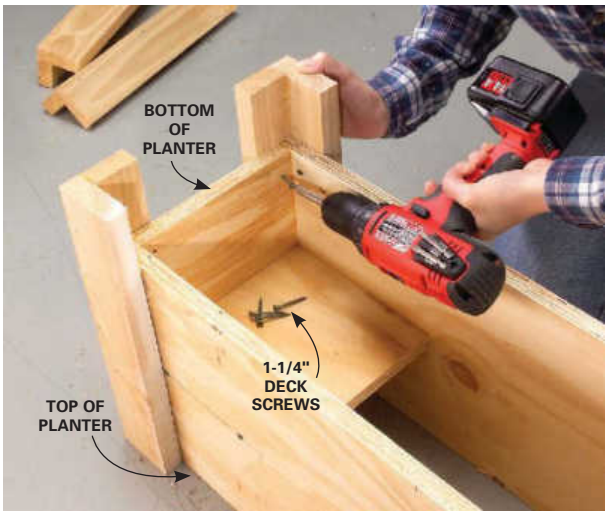


1 BUILD THE BOX
Cut the plywood sides to size and glue and nail the sides together. Use clamps to hold the sides upright.



2 ADD THE BRACES
Predrill screw clearance holes through the planter sides and screw in a plywood brace at each end. Center the brace.

3 ASSEMBLE THE LEGS
Rip 5/4 decking material and cut it to length for the legs. Glue and nail a 3-in. piece to a 2-in. piece. Buy your plastic planter boxes first and adjust the planter dimensions if necessary.



4 ATTACH THE LEGS
Set the plywood box on a flat surface and screw the leg assemblies to it. Make sure the legs are flush with the top of the planter box.

WHAT IT TAKES
TIME: 1 weekend
COST: $100 or less
SKILL LEVEL: Beginner
TOOLS: Basic hand tools, drill, table saw

The core of this planter is a box made from 3/4-in. CDX or BC plywood. Most home centers and lumberyards will sell you a partial sheet of plywood and cut it into manageable sizes for you to haul home. Cut plywood pieces to final size with a table saw, or clamp a straightedge to the plywood and cut it with your circular saw. Assemble the box with water-resistant wood glue and 6d galvanized box nails or exterior-grade screws (**Photo 1**). Add plywood braces inside the long planter to square the box and hold the long sides straight. We centered our braces, but you can shift them down if they obstruct the liner (**Photo 2**). The other two planters don't need braces if you make sure they're square after you assemble them. Check with a framing square and add braces if they're needed.

We used 5/4x6 (1-in. x 5-1/2-in. actual dimensions) cedar decking for the legs, but you can substitute other 5/4 decking. First rip the deck boards to 5-1/4 in. to remove the rounded corners on one edge. Then run the squared edge against the table saw fence when you rip the 3-in.- and 2-in.-wide leg pieces. Cut the pieces to length and then glue and nail them together with 8d galvanized casing nails (**Photo 3**). Sand the saw marks from the board edges before you screw the assembled legs to the box (**Photo 4**).

Ripping the bevel on the 2x4 top cap (**Photo 5**) may require you to remove the blade guard as we did. If so, use extreme caution to keep your fingers well away from the blade. Make

Beadboard planter

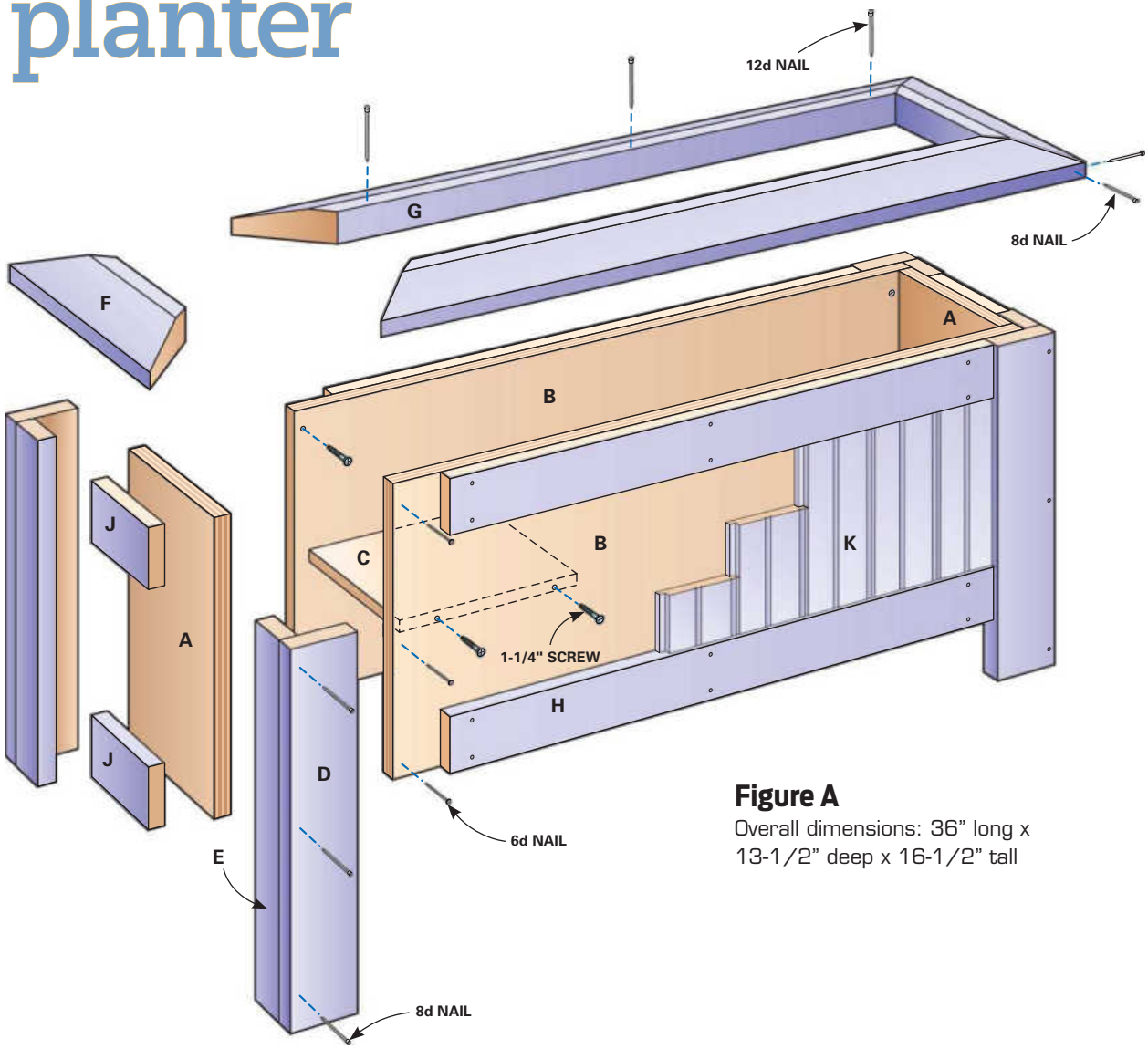


Figure A
Overall dimensions: 36" long x 13-1/2" deep x 16-1/2" tall

Materials List

ITEM	QTY.
2' x 4' 3/4" CDX plywood	1
5/4x6 x 6' deck board	1
2x4 x 6' cedar or pine	2
1x3 x 6' cedar or pine	2
5/8" x 3-1/2" beaded tongue-and-groove	14'
Water-resistant glue	
4d, 8d and 12d galvanized casing nails	
6d galvanized box nails	
1-1/4" deck screws	
Plastic planter (to fit 6-1/2" x 29" opening)	

Cutting List

KEY	PCS.	SIZE & DESCRIPTION
A	2	3/4" x 8" x 11-7/8" plywood ends
B	2	3/4" x 32" x 11-7/8" plywood sides
C	2	3/4" x 8" x 7-3/4" plywood braces
D	4	1" x 3" x 15" legs
E	4	1" x 2" x 15" legs
F	2	1-1/2" x 3-1/2" x 13-1/2" beveled cap
G	2	1-1/2" x 3-1/2" x 36" beveled cap
H	4	3/4" x 2-1/2" x 28-1/2" top trim (cut to fit)
J	4	3/4" x 2-1/2" x 6" trim (cut to fit)
K	22	5/8" x 3-1/4" x 6-7/8" lengths of beadboard

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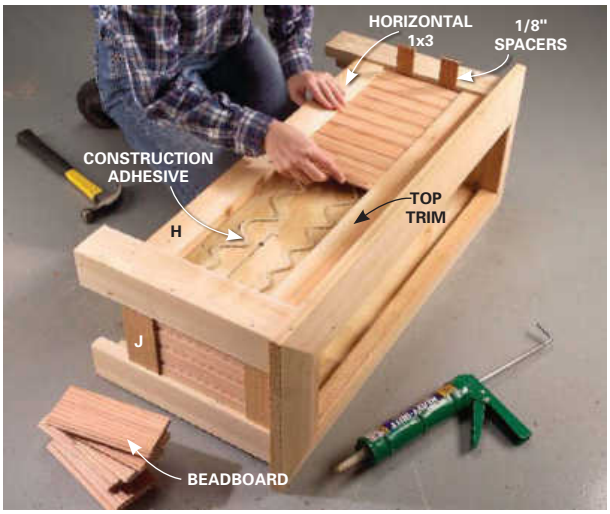
CAUTION: You may have to remove the blade guard for this cut. Saw carefully.

5 BEVEL THE CAP BOARDS Rip a 20-degree bevel on the 2x4 caps with a table saw. Use a featherboard and push stick for extra safety.

6 ASSEMBLE THE CAP Cut the cap pieces to length with 45-degree miters on the ends. Drill pilot holes for the nails. Then glue and nail the miters together.

7 ATTACH THE CAP Drill pilot holes and glue and nail the cap to the planter box. Measure to make sure the overhang is even on all sides.



8 COVER THE BOX Cut the trim pieces H and J to length and nail them to the top and bottom edges of the box. Cut beadboard to fit and glue the pieces onto the plywood with construction adhesive.

sure the blade is tilted away from the fence as shown in the photo. Mount a featherboard and use push sticks to complete the cut. Start the cut by pushing with your back hand while holding the board down with a push stick in your front hand. Keep a second push stick within easy reach. When your back hand gets to the rear edge of the table saw, pick up the second push stick and use it along with the front push stick to push the board clear past the saw blade. Keep your attention focused on the saw blade at all times. Shut off the saw and wait for the blade to stop before retrieving the beveled board.

Photo 6 shows how to assemble the top cap pieces into a frame that's easy to attach to the box. Start by gluing the miters and clamping one long side as shown. Then drill 1/8-in. pilot holes for the nails. Drive a pair of 8d galvanized casing nails from opposite sides at each corner to pin the miters together. Offset the nails slightly so they don't hit each other.

Mount the frame to the box by centering it with an even overhang all around and nailing it down with 12d galvanized casing nails (**Photo 7**). Measure and drill 5/32-in. pilot holes for the nails, making sure they're centered on the top edges of the plywood.

Add siding to complete the planter

Beadboard is great for a traditional-looking painted planter. For the best-looking planter, plan ahead and cut the first and last boards to equal width. Start by nailing the top trim (H) to the plywood box with 4d galvanized casing nails. Use a precut length of beadboard as a spacer to position the bottom board precisely. When you glue in the beadboards, be sure to leave a 1/8-in. space at each end to allow room for expansion (**Photo 8**). Fill the space with caulk before painting.

Lap siding planter

We sided the tall box with 1/2-in. x 3-1/2-in. cedar lap siding. Simply cut the siding to fit between the legs. Rip a 1-in. strip off the thin edge of a siding piece for a starter. (Rip the leftover to fit at the top later.)

Nail the starter strips along the bottom of the plywood (under the first row of siding) to hold the first piece of siding at the correct angle. Predrill 1/16-in. holes 3/4 in. from the end and 5/8 in. from the bottom of each piece to prevent splitting. Then nail on the siding with 4d galvanized box nails. The top cap on this planter fits flush to the inside edge of the plywood box, which may cause the nails protruding through the inside to interfere with the plastic planter. If so, bend them flat or clip them off. You'll save measuring time by making a simple spacing jig as shown below. We finished this planter with transparent deck stain.

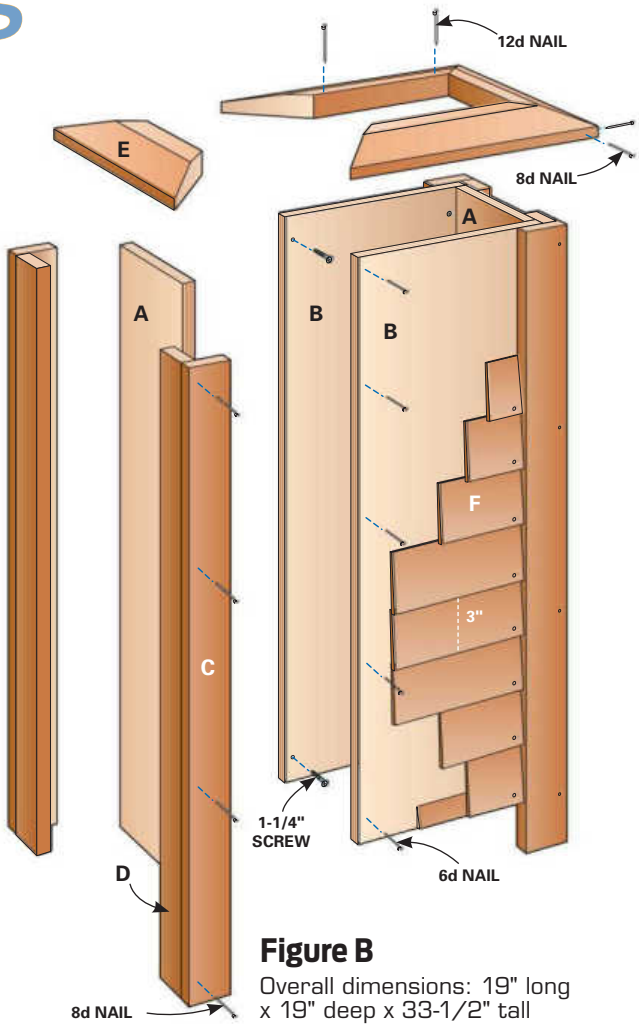


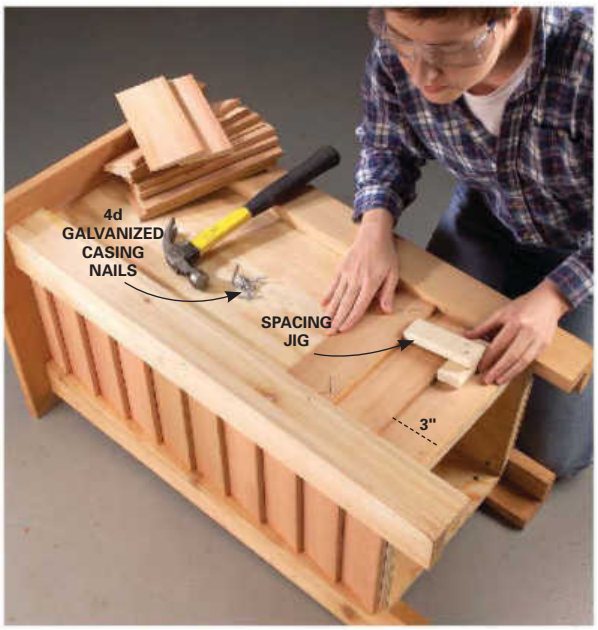
Figure B
Overall dimensions: 19" long x 19" deep x 33-1/2" tall

Materials List

ITEM	QTY.
4' x 8' x 3/4" CDX plywood	1
5/4x6 x 6' deck board	2
2x4 x 8' cedar or pine	1
1/2" x 3-1/2" lap siding	36'
Water-resistant glue	
4d, 8d and 12d galvanized casing nails	
6d galvanized box nails	
1-1/4" deck screws	
Plastic planter (to fit 12" x 12" opening)	

Cutting List

KEY	PCS.	SIZE & DESCRIPTION
A	2	3/4" x 12" x 29" plywood ends
B	2	3/4" x 13-1/2" x 29" plywood sides
C	4	1" x 3" x 32" legs
D	4	1" x 2" x 32" legs
E	4	1-1/2" x 3-1/2" x 19" beveled cap
F	40	1/2" x 3-1/2" x 9-3/4" siding (cut to fit)



SIDE THE PLANTER
Cut a starter strip and lap siding pieces to length and nail them to the plywood starting at the bottom and working up. Lap each row 1/2 in. over the siding below.

Cedar shingle planter

Wood shingles are perfect for a rustic-looking box. And finishing the planter is a snap if you use deck stain like we did. The only drawback to shingles is that you may have to buy a whole bundle, many more than you'll need to side one planter.

The butt end of shingles is a little too thick for the proportions of this planter. So before cutting the shingles to their final length, trim off about 4 in. from the thick end (assuming your shingles are about 16 in. long). Then cut and install them as shown.

Start with a double thickness of shingle on the first row. Then offset the joints by at least 1-1/2 in. from one row to the next. Also stagger the shingles up and down if you like the "shaggy" look. Nail the shingles to the plywood box with 3d galvanized box nails. Position the nails so the next row will cover them. The nails will stick through the inside of the box but won't interfere with the plastic planter box.

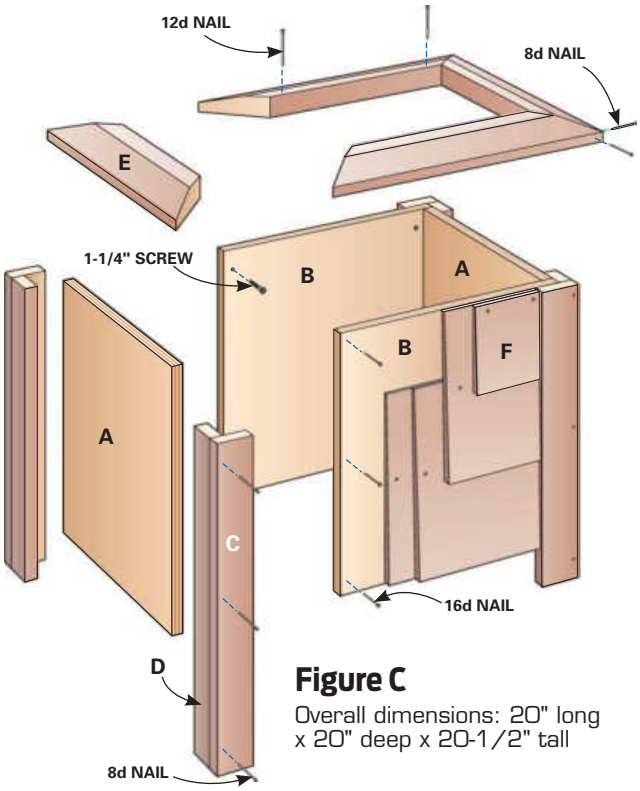


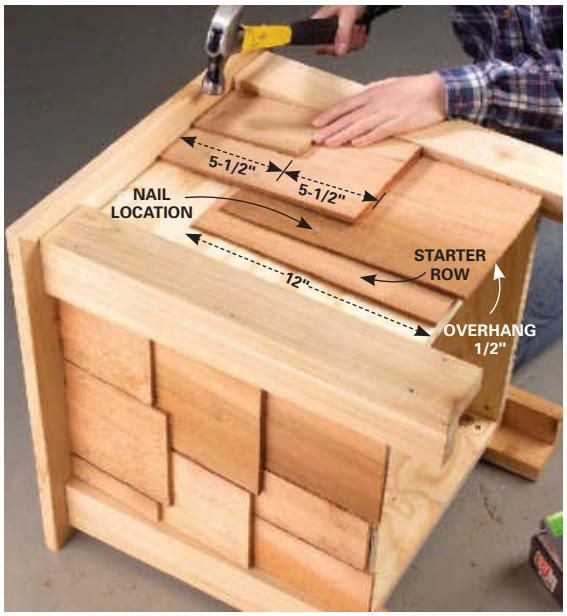
Figure C
Overall dimensions: 20" long x 20" deep x 20-1/2" tall

Materials List

ITEM	QTY.
16" x 62" x 3/4" CDX plywood	1
5/4x6 x 8' deck board	1
2x4 x 8' cedar or pine	1
Bundle of cedar shingles (50 or 60)	1
Water-resistant glue	
8d and 12d galvanized casing nails	
3d and 6d galvanized box nails	
1-1/4" deck screws	
Plastic planter (to fit 13" x 13" opening)	

Cutting List

KEY	PCS.	SIZE & DESCRIPTION
A	2	3/4" x 16" x 14-1/2" plywood ends
B	2	3/4" x 16" x 16" plywood sides
C	4	1" x 3" x 19" legs
D	4	1" x 2" x 19" legs
E	4	1-1/2" x 3-1/2" x 20" beveled cap
F	50–60	12" cedar shingles (cut to fit)



SHINGLE THE PLANTER
Cut 4 in. off the thick end of all 16-in. shingles to reduce their length to 12 in. Then cut them to fit and nail them to the plywood, starting at the bottom. Stagger the slots between shingles.

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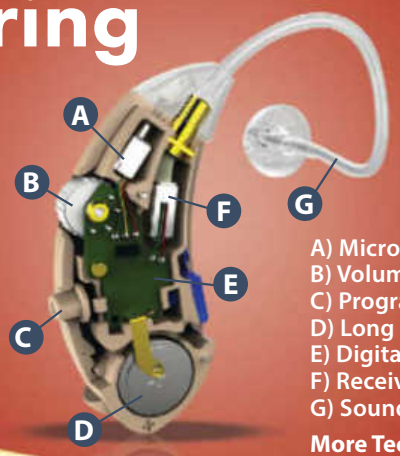

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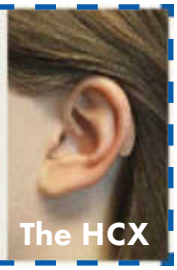

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Classic Cedar and Copper Trellis

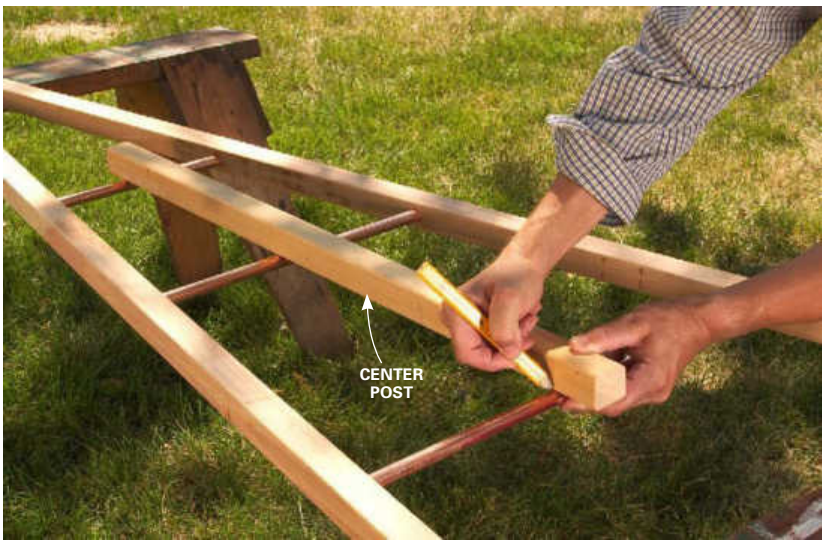
Climbing plants like vines and roses lend a lot of charm to an ordinary garden, especially when they're winding up a trellis as stunning as this one. And its character just grows richer as the wood turns gray and the copper develops a beautiful green patina.

by Jason White
editors@thefamilyhandyman.com

WHAT IT TAKES

Time: 1 day
Cost: $125 to $200
Skills: Beginner
Tools: Drill, 5/8-in. spade bit, miter saw, pipe cutter (or hacksaw), hammer, random orbital sander or belt sander.

1 DRILL THE HOLES
Drill holes in the legs using a wood scrap cut at 10 degrees to guide you. With all four legs clamped together, it's easy to get the holes to line up.



2 MARK THE CENTER POSTS FOR PIPE HOLES
Cut the center posts to length, and use a miter saw to cut points on the ends. Lay a center post on the rungs, which are cut from copper pipe, and mark the rung holes directly on the post. Be sure the post is centered top to bottom and side to side.

Choosing materials

One of the best things about this trellis is that it's easy to build with just basic tools and off-the-shelf materials from your local home center. We used cedar for our trellis, but any rot-resistant wood will do. The scrollwork is made from No. 6 solid copper wire (the kind used for grounding electrical panels). It's expensive, though—about $100 for enough to make scrolls for all four sides. However, you can save $75 by making scrolls only for the "show" side, which lowers the cost of the trellis to $125.

The legs and center posts are 2x2 cedar, and the horizontal rungs that connect them are 1/2-in. copper pipe. You can make the cap like we did or buy one made for deck and fence posts.

Start with the legs and rungs

Cut the four legs to length, set them on sawhorses and clamp them all together so that the tops are even. Measure, mark and drill 5/8-in.-diameter holes 28 in., 41-1/2 in. and 59 in. from the tops. Each hole is drilled 1 in. deep at a 10-degree angle. Use a guide block cut at an angle to help guide your drill bit (see **Photo 1**). You can cut a guide block by setting your miter saw at 10 degrees. If you don't have a miter saw, pick up a protractor (about $10) at a home center. The drill should "lean" toward the tops of the legs. Now flip each leg 90 degrees, clamp them together again and repeat the process.

Using a pipe cutter or hacksaw, cut six pieces of 1/2-in. copper pipe to

Cutting pointed ends

To cut the pointed ends of the center posts, draw a cutting line on all four sides 3/4 in. from each end. Then, using a miter saw, make a 45-degree cut along the line on each side of the post.

Figure A
Cedar and copper trellis

Overall dimensions:
74" tall; 27" wide at base

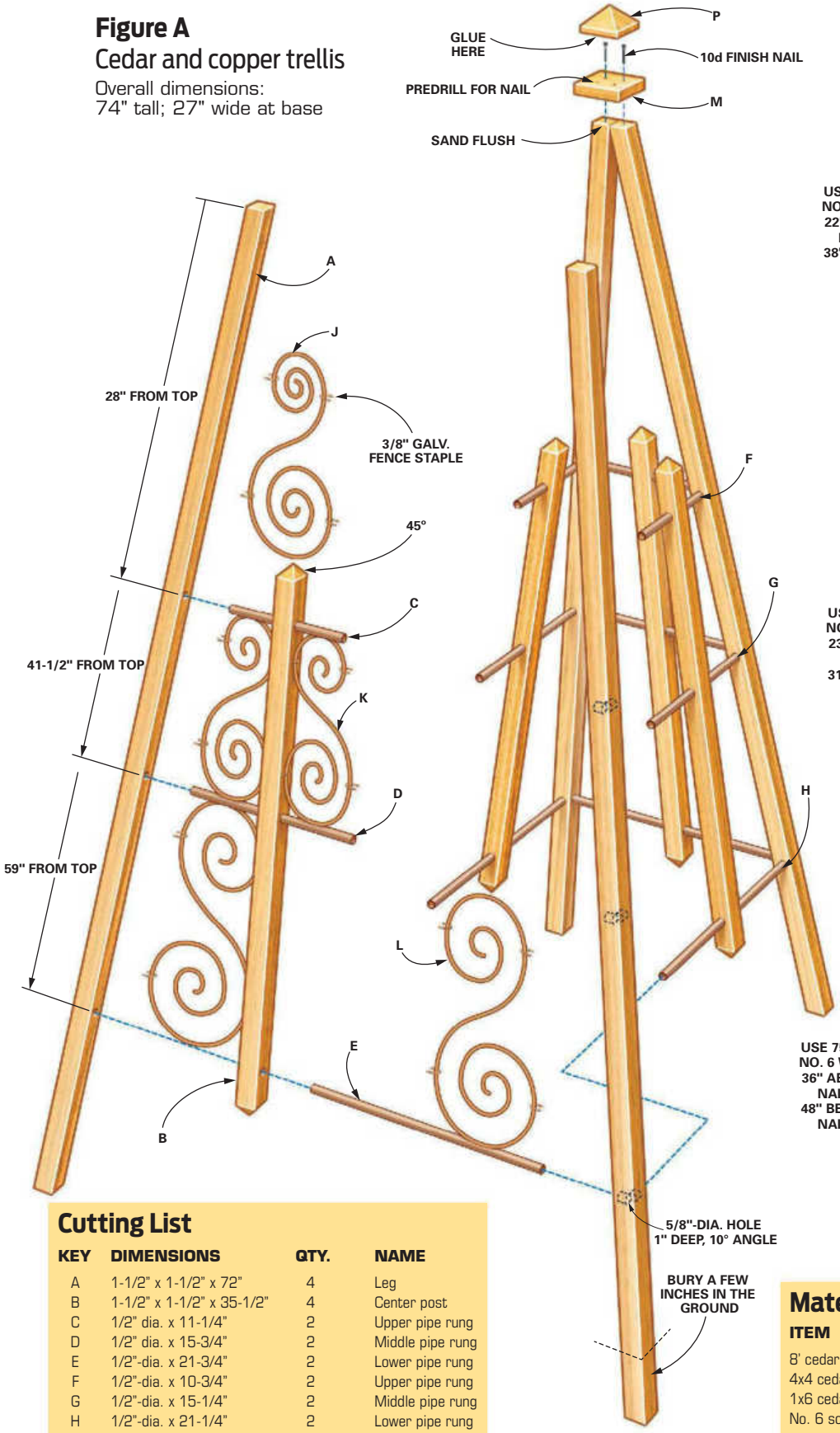


Figure B
Upper scroll

Enlarge to an overall length of 13-3/4"

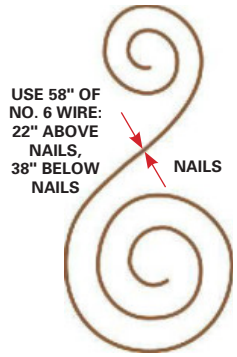


Figure C
Middle scroll

Enlarge to an overall length of 12-3/4"

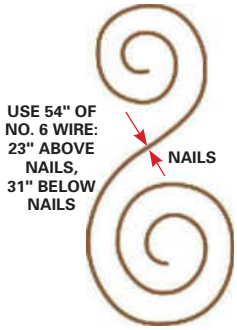
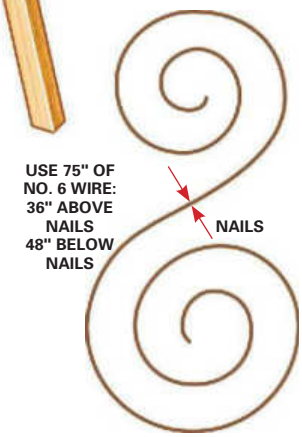


Figure D
Lower scroll

Enlarge to an overall length of 16-3/4"



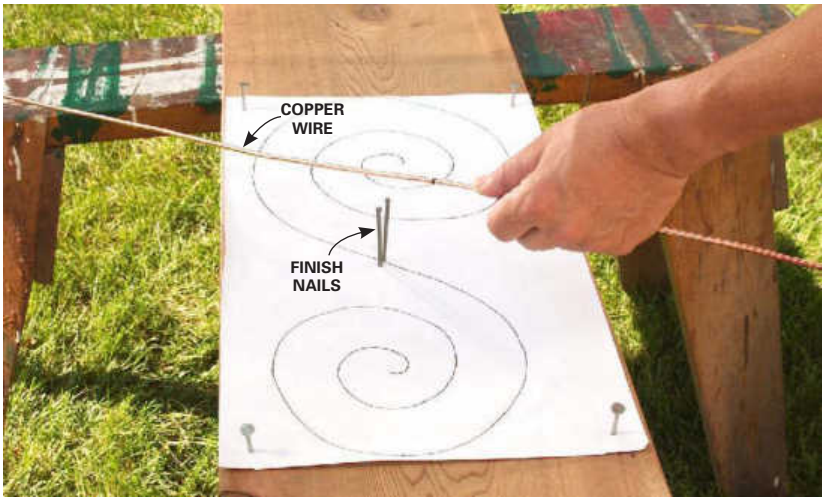
Cutting List

KEY	DIMENSIONS	QTY.	NAME
A	1-1/2" x 1-1/2" x 72"	4	Leg
B	1-1/2" x 1-1/2" x 35-1/2"	4	Center post
C	1/2" dia. x 11-1/4"	2	Upper pipe rung
D	1/2" dia. x 15-3/4"	2	Middle pipe rung
E	1/2"-dia. x 21-3/4"	2	Lower pipe rung
F	1/2"-dia. x 10-3/4"	2	Upper pipe rung
G	1/2"-dia. x 15-1/4"	2	Middle pipe rung
H	1/2"-dia. x 21-1/4"	2	Lower pipe rung
J	60" No. 6 wire	4	Upper scroll
K	54" No. 6 wire	8	Middle scroll
L	84" No. 6 wire	8	Lower scroll
M	3/4 " x 4" x 4"	1	Lower cap
P	3-1/2" x 3-1/2" x 2-1/4"	1	Upper cap

Enlarging scroll patterns
Photocopy the pattern at 400% enlargement. Then photocopy that first copy at 190%.

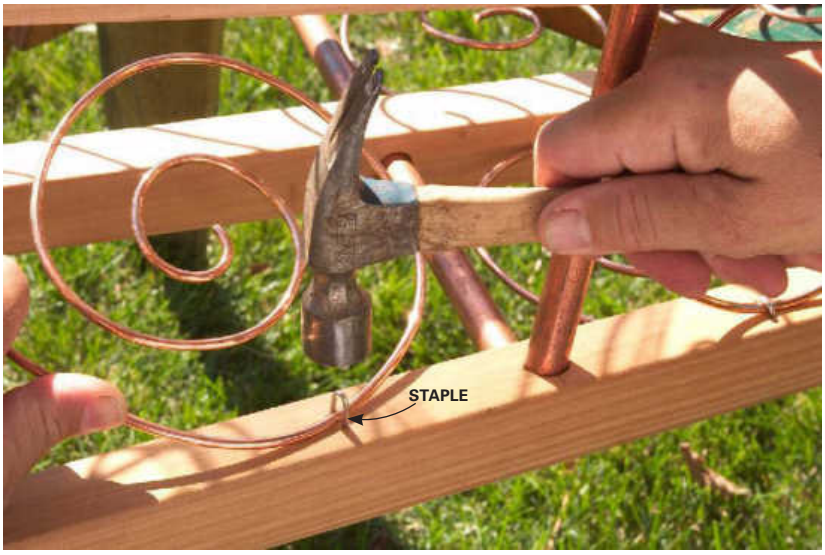
Materials List

ITEM	QTY.
8' cedar 2x2s	6
4x4 cedar post	1'
1x6 cedar board	1'
No. 6 solid copper wire	26' 4" per side
1/2" copper pipe	16'
Fence staples	1 box
10d finish nails	6
Construction adhesive	1 tube



3 MAKE A BENDING JIG
The bending jig for the wire scrolls is a piece of scrap wood with a copy of the scroll pattern (p. 63) tacked to it. Two finish nails in the middle hold the copper wire.

4 FOLLOW THE PATTERN
Bend the scrolls with your hands, following the pattern. The copper wire is soft and will bend easily. When you've bent one side, weight it down and bend the other.



5 FASTEN THE SCROLLS
Attach the scrolls with small fence staples. You can bend the scroll out of the way temporarily to make room for the hammer.

length for the rungs. Note in the Cutting List that two sides of the trellis have slightly longer rungs (C, D and E). Cut those now. Temporarily assemble one side of the trellis—two legs and three pieces of pipe. Tap the legs to get the pipe seated. The tops of the legs should be almost even.

Make the center posts

After cutting the center posts (B) to length, use a miter box or miter saw to cut points on the ends of the center posts. A line marked around all four sides will guide you (see "Cutting Pointed Ends," p. 62). Lay the center post on top of the assembled side (see **Photo 2**). Be sure the post is centered. Mark the post for the pipe holes, then transfer the marks to the other three center posts and drill the holes at 90 degrees. Drill from one side until the point of the spade bit pokes through, then stop and drill through from the other side. This will give you cleaner holes.

Assemble two sides

Build two sides of the trellis. Put the longer sets of pipes (C, D and E) through the holes in the center posts, get them centered, and then place the ends of the pipes in the legs. Lay an assembled side on sawhorses with the remaining holes in the legs facing up. Place a bolt or old screwdriver in each hole and whack it with a hammer. That will crush the end of each pipe, locking it into place and making space for the adjoining pipe. Cut the remaining pipe rungs (F, G and H) and then fit the rungs and remaining center posts between the two assembled sides to form the complete trellis structure. Tighten any loose joints by putting a bit of epoxy in the pipe hole.

Bend the scrolls

Make a bending jig out of a 2x12 or a scrap piece of plywood at least 11 in. x 18 in. Enlarge the patterns in **Figures B, C and D** on a copier until the dimensions are correct, and tack a pattern to the jig (see **Photo 3**). Nail two 10d finish nails on both sides of the scroll shape to hold the wire (see **Photo 3**).

Cut one piece of wire to length. Measure from one end to find the point that goes between the two

ART DIRECTION **MARCIA ROEPKE** • PHOTOGRAPHY **HSP** • ILLUSTRATIONS **FRANK ROHRBACH III**

6 LEVEL THE TOP
Using coarse sandpaper, sand the top where all four legs come together. You're forming a flat surface for nailing on the cap.

finish nails (see pattern drawing), mark that spot, and lay the wire on the jig so your mark is between the two nails. Using your hands only, bend the wire to the shape on the pattern (**Photo 4**). There should be a few extra inches of wire on each end to give you something to hold.

When you've got the first half bent to shape, snip the end. Put a weight or a clamp on the part you've done, then bend the other side. You don't have to be fussy about matching the pattern; close is good enough. If your first scroll was a success, cut the remaining piece of wire and bend the rest of the scrolls.

For each of the three different size scrolls, do one for practice before cutting the remaining wire. If you have trouble, cut the wire a little long so you'll have more to work with.

Final assembly

Lay the trellis on its side and use fence staples to attach the scrolls to the 2x2s (**Photo 5**). Be sure to get the pairs of scrolls on each side of the trellis to be symmetrical (a right and a left), and to reverse the direction between the lower and the middle scrolls (see **Figure A**).

When all the scrolls are attached, stand the trellis up, grab a stepladder and sand the tops of the legs flat and even (**Photo 6**). If the pieces vibrate too much, tape them all together with duct tape.

Cut the lower and upper cap pieces (M and P). For the facets (angled sides) on the upper cap (P), start with a 1-ft. piece of 4x4 so you have enough wood to hold on to while you cut the facets. Then trim off the finished cap piece. When both cap pieces are cut, drill pilot holes in the lower cap (M), nail it on, then glue on the upper cap (P) with construction adhesive or epoxy.

Install the trellis in your garden

Dig the bottoms of the legs into the ground and get the trellis plumb. You'll have to do it pretty much by eye. If your location is windy, anchor the bottoms of the legs in the ground. One way is to bend a couple of 3-ft. pieces of 1/8-in. rod into a U-shape so they can be driven in around the legs. Then fasten them to the legs with fence staples and cover with dirt or mulch.

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7 Ways to work safely with LEAD PAINT

Minimize the dangers when prepping for new paint!

by Jason White
editors@thefamilyhandyman.com

Lead paint is dangerous, especially for small children, who might eat crumbling paint chips or pick up lead dust on their hands, which they might stick in their mouth. Each year, thousands of children test positive for dangerous levels of lead. Lead in children—even small amounts—can cause behavioral issues, a lower IQ, ADD and physical problems.

Homes built before 1978 are likely to contain at least some lead paint. If your home is that vintage, it's important to reduce the risk of exposure to you and your family when doing paint prep, repairs or home renovation.

MEET THE EXPERT

Dan Locher, supervisor for the Minnesota Department of Health's Asbestos and Lead Compliance Unit, contributed to this article.

1 Test for lead

Most lead-paint poisoning results from exposure to lead dust. Even if you don't see any peeling paint, lead dust might still be present. Old doors and windows have painted parts that rub together and create dust, or there might be small amounts still present from a previous remodeling project. Testing will determine if you have a lead hazard.

Various types of test kits are available for about $10. They're all a little different, so read and follow the directions carefully. Some come with everything you need to collect and send samples to a lab for analysis, for which you pay a separate fee ($15 to $20 per sample). Others, like 3M's LeadCheck swabs shown above, don't require lab testing. You just squeeze a swab while rubbing it onto a painted surface. If the tip of the swab turns pink or red, you've got lead.

ART DIRECTION **VERN JOHNSON** • PHOTOGRAPHY **TOM FENENGA** and **HSP**

2 Seal off your work area

Remove all furniture and rugs in the room you're about to work in and cover floors with 6-mil polyethylene (poly) sheeting. Use duct tape to secure it to the floor tight to walls and at least 5 ft. beyond the room you're working in. Avoid taping it to baseboards or other trim if you're worried about damaging the paint. Turn off the furnace and then cover supply and return registers with poly and tape. Keep windows closed to prevent dust and chips from blowing around, and cover and tape off doors and other openings to keep dust contained to your work area.

ZIP IT! To make getting in and out of the room easier while containing lead dust, tape a piece of poly around the perimeter of a doorway and create an opening by installing a ZipWall self-adhesive zipper on it ($20 at home centers). When you need to leave, just unzip the opening, walk through and zip it back up.

3 Protect yourself

Wear a Tyvek suit or a long-sleeved shirt, long pants, neoprene gloves and washable shoes. Wash work clothes in a load separate from other laundry. Also wear safety glasses or goggles to protect your eyes from debris, and a half-mask respirator with P100 filtration to protect your lungs.

4 Work wet

If you must sand or scrape lead paint, do it wet. Spraying the area with water before sanding or scraping minimizes dust. Make sure electrical outlets are turned off before spraying near them. Use a medium- or coarse-grit sanding sponge to smooth rough areas. Avoid using an electric sander to smooth or remove lead paint. The goal is not to remove all of the paint; you just want to remove any loose, flaking paint.

RIDGID

5 Vacuum the chips

The most important part of making a room lead-safe is the cleanup. If it's not done properly, lead dust can get left behind—enough to harm a young child. Start by sucking up paint chips with a HEPA vacuum approved for lead paint pickup ($350 to $800). Some aftermarket vacuum filters are labeled as HEPA, but they're not approved for lead paint.

IF YOU MUST STRIP...

In cases where complete removal of lead paint is desired, consider using a stripping product like Peel Away, which loosens and helps contain paint chips. If you'll be sanding afterward, be sure to wet-sand. Lead residue could still be trapped in the fibers of the wood even after it's been stripped bare.

6 Give it a wipe

Spray all-purpose cleaner mixed with water onto a folded paper towel and wipe in only one direction to avoid recontaminating previously cleaned areas. Use a fresh side of the towel for each wipe. You can also do this with a cloth rag by dunking it in cleaner, wiping the area, and rinsing it out in a separate bucket filled with clean water. Just be sure to change the rinse water often.

7 Bag the residue

Before doing any repainting, finish cleaning the room and remove all poly sheeting. Seal it in a heavy plastic garbage bag and dispose of it with your regular trash (if allowed). Finally, clean uncarpeted floors with a HEPA vacuum and wash them with all-purpose cleaner.

GOT OLD PLUMBING?
YOU MIGHT HAVE LEAD

If your home was built before 1986, you might have lead in your tap water. Many houses built through the early 1900s have lead service lines and pipes, and homes built through the late 1980s have copper pipes and fittings joined with lead-based solder. Brass faucets and fittings contain lead, too. When water that's acidic or low in mineral content sits in older plumbing systems for several hours, lead can leach into the water. However, even if you have lead in your plumbing system, your water might be safe to drink. That's because, over time, minerals in water coat the insides of pipes, helping to prevent leaching of lead.

Test your water

First, test your water for lead. Some water suppliers will test your water for free. If yours won't, or you're on a private well, you can buy a test kit at your local home center. Expect to spend about $10 for the kit, plus $30 more for lab analysis.

Call your water supplier

If a water test shows unsafe levels of lead, you need to figure out why. Call your municipal water supplier and ask whether the water service pipe at the street has lead in it, and whether your water is corrosive enough to be causing lead to leach from pipes and fittings inside your house.

Get the lead out!

If you have unsafe lead levels in your drinking water and your supplier can't help you, you'll have to take action yourself. That might mean replacing some lead plumbing components or installing a home water filtration system approved for lead. As a temporary measure—until you can eliminate the source of the lead—the Centers for Disease Control and Prevention (CDC) recommends turning on faucets for several minutes to flush out water that's been sitting in your pipes for more than six hours. For more information, go to cdc.gov/nceh/lead/tips/water.htm.

WHAT IS THE RRP RULE?

In 2008, a federal rule was enacted requiring people or companies being paid to do work that disturbs paint on houses built before 1978 to become lead-certified by the Environmental Protection Agency (EPA).

The EPA's "Renovation, Repair and Painting" (RRP) rule mandates that these people or companies follow specific work practices to keep children and families safe from lead exposure during work or face fines of thousands of dollars for failing to comply.

To get certified, they must complete an eight-hour lead paint training course that covers topics like dust-containment and cleanup and disposal procedures.

The RRP Rule does not apply to homeowners working on their own homes. For more information about the RRP Rule, visit epa.gov/lead.

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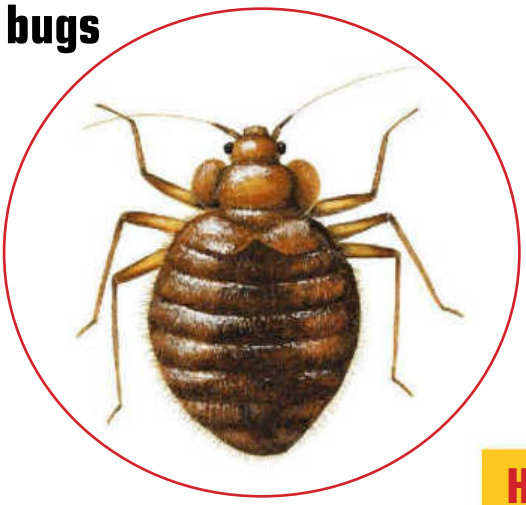
HOW TO BEAT BED BUGS A DIY GUIDE

Make your home free of bed bugs



HOW TO:
Find them, exterminate them ... and avoid them in the first place!

Bed bugs have been pestering humanity for thousands of years, but in the 1950s they finally met their match: the pesticide DDT. Then DDT was banned, but for most of the 40 years since, bed bugs have not been a major problem. Now, however, these blood-sucking vermin are back with a vengeance. That's the bad news.

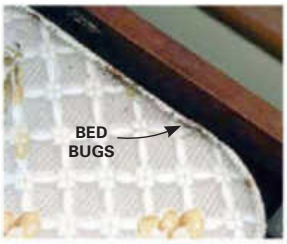
The good news is that, unlike mosquitoes and ticks, bed bugs don't spread disease, and there are practical steps you can take to prevent an infestation. And if you do get bed bugs, you can get rid of them yourself. We'll show you what to look for, how to kill bed bugs if you find them, and how to keep them out!

ART DIRECTION **MARCIA ROEPKE** • PHOTOGRAPHY **TOM FENENGA UNLESS NOTED**

GETTY

BED BUG DETECTION

Pest control pros tell us that almost half the bed bug calls they get turn out to be false alarms. So before you take action, make sure you actually have them. Here are four key ways to detect them.



JAY BRUESCH

Check your mattress

Bed bugs don't like being jostled, so they avoid hanging out in your hair or clothes, but they do like to stay close to their food source, namely *you*. The mattress is the first place you should inspect. Bed bugs love to hang out in cracks and crevices. They can fit into any gap the thickness of a business card. One of their favorite spots is the piping along the edge of a mattress. Look for the bugs themselves, their dark droppings, your dried blood, eggs and gold-colored shells that have been left behind after molting.

Perform a quick inspection of the upper piping every time you change your sheets. Make a more thorough examination by folding the piping over and closely inspecting both sides all the way around, top and bottom. Do this a couple times a year or every time you flip or rotate your mattress.

Set traps

Traps aren't an effective way to wipe out a bed bug infestation, but they're an excellent way to determine whether you have them. Set traps in areas where they may hide or travel, like near baseboard trim or under nightstands. If they aren't living in your mattress or other parts of your bed, that means they need to travel up the legs of the bed frame to get to you, so place traps there as well.

If you confirm you have bed bugs in one bedroom of the house, you'll have to treat that entire room, but you won't necessarily need to treat the entire house. Set up traps to monitor other bedrooms and living areas to make sure they stay bug free. These Hot Shot traps are available at The Home Depot and cost $6 for four.

GETTY

Look for bite marks

Bed bugs love fast food. They like to feed and then scurry back to their hiding places. They try to avoid crawling all over their food for fear of waking it/us. They usually bite the bare skin they find closest to the mattress. That's why it's common to see two or three bite marks in a line along the skin that was in contact with the mattress or pillow.

Everyone reacts differently to a bed bug bite. Some will develop small itchy bumps like mosquito bites; others will suffer from large, puffy red lesions the size of a quarter. A lucky few will have no reaction at all. Other signs of bed bugs are bloodstains on your sheets, pillows and blankets. Are you scratching yet?

Know what they look like

A fully fed adult bed bug is about the size and shape of an apple seed. An unfed bed bug is more round and flat like a tick. Newly hatched bed bugs are the size of a poppy seed and are golden in color. Their eggs look like small grains of white rice, about 1 mm in length (sorry for all the food references).

If you find what you think might be a bed bug, take it to the entomology department of the nearest university or to a pest control company for official identification.

BED BUGS IN APARTMENTS

Your bed bugs may be migrating from your neighbor's place. Call your property management company. Insist they inspect the apartments on either side, above and below.

Hiring a pro to wipe out bed bugs isn't cheap. Expect to pay about $200 per room, and you'll likely need a few chemical treatments. Professional heat treatments will cost even more (see "Use Heat Instead of Chemicals," p. 77). And even if you hire a pro, you'll still have to do lots of work yourself (moving furniture, washing all clothes, etc.). So consider declaring a DIY war on bed bugs. If you're willing to spend $100 to $200 and do things right, your chances of success are excellent.

When working with chemicals, always read the directions. You should be able to stay in the room during the treatment process. Room treatments entail thorough cleaning and applying chemicals. The process needs to be repeated three times, two weeks apart.

Bag and wash clothes and bedding

The first thing to do after confirming an infestation is to bag up all your clothes, towels, bedding and curtains in plastic bags. Tie tight knots to seal the bags and keep them tied until they reach the washing machine. Wash with hot water and dry thoroughly. Temperatures over 120 degrees F will kill bed bugs and any eggs they've left behind.

Store clean clothes in another room until you've finished treating the infested room. If you plan to take laundry to a professional cleaner or public laundry, treat it chemically first to avoid spreading the bugs (see "Create a Kill Chamber," p. 76).

Clean everything

Now that all the stuff is out of the bedroom, it's time to treat the room itself. The first step is to vacuum every surface in the room, the baseboards, all the furniture, the mattress, box spring, bed frame, everything. Use a small wand to get into all the corners and crevices.

When you finish, throw out the vacuum bag to avoid spreading the bugs. If you use a shop vacuum or bagless vacuum, dump the contents you've collected into a bag, tie it up, and throw it out. And treat the filter and the inside of the canister with contact spray insecticide. Flat surfaces like walls and dresser tops can be wiped with alcohol. Wipe a small inconspicuous area first to see if the alcohol will damage the paint or finish.

Isolate the bed

What's the best way to get rid of bed bugs? Stop feeding them. To prevent those unwanted dinner guests, isolate your mattress from the rest of the room. Start by pulling the bed away from the wall and away from other furniture like nightstands and chairs. Remove box spring skirting that hangs down to the floor. Oversize blankets that drape to the floor can also act as a ladder for the little buggers.

Finally, place all the legs into insect interceptors like these made by ClimbUp. They allow bugs to climb into the outer pitfall area, but the slick plastic coated with talcum powder keeps them from climbing out or reaching the center well and climbing up your bed frame leg. These cost $16 for a set of four.

Spray bug killer

Spray insecticide on all the areas where you've seen signs of the bugs or the bugs themselves. And spray all the areas where they're likely to hide, like the furniture near the bed, the entire bed itself and the perimeter of the walls near the baseboard.

Most sprays are contact killers, which means they kill only the bugs and eggs they touch directly, so there's no reason to spray all the walls, ceiling and the entire floor. Spray pesticides are available online and at home centers and hardware and discount stores. Many brands kill other insects, like fleas and roaches, as well. They cost from $10 to $40.

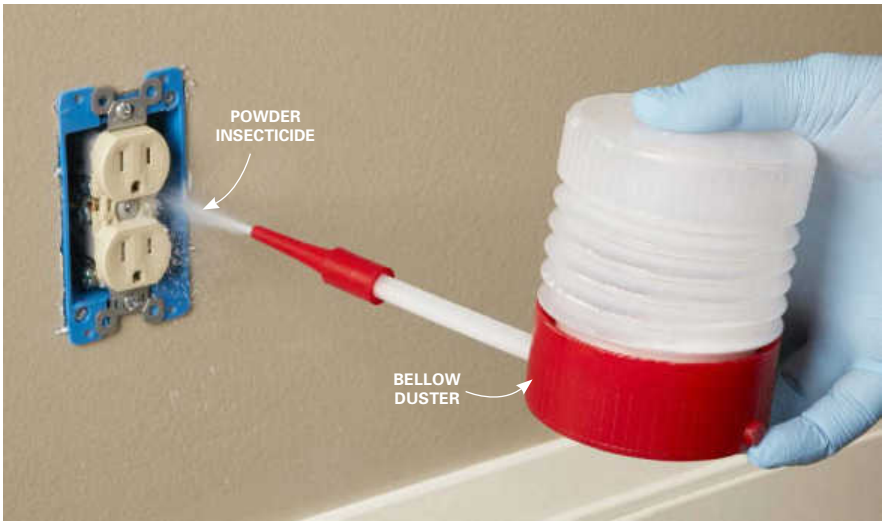
Bag your mattress

Once you've vacuumed and chemically treated your mattress and box spring, enclose them in encasement bags. If the bed bugs found a way inside the mattress, the odds are that the spray chemicals did not kill them. Encasement bags have special zippers that trap the bed bugs and prevent them from escaping. Keep these bags on for at least a year because a fully fed bed bug can live more than 10 months between meals.

If the idea of sleeping on a tiny bed bug cemetery is too much to bear, the only alternative is to toss the mattress and box spring and buy new ones. Just be sure to wrap up the infested one before hauling it through your house, and don't buy a used mattress! These twin-size encasement bags cost about $20 each online (you'll need two).

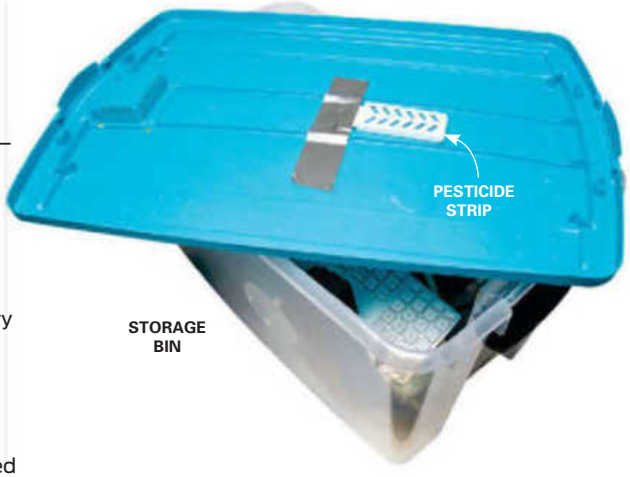
Spread a residual powder

It's not likely that you'll kill *all* the bed bugs with a bed bug spray. That's where a residual powder insecticide comes into play. It kills any bugs that wander through the powder. Some powders can kill bugs for many years if left undisturbed. Skip the open areas and spray the powder in those places where you think they'll be traveling to and from, like near bed legs and under baseboard trim.



If at all possible, pull up the carpet where it meets the wall and puff powder around the whole perimeter of the room. Inside outlet boxes is a great place to use powders because sprays and electricity don't mix. Bellow dusters work great for spreading residual insecticide powder. The one shown here costs about $12 online. An old makeup brush is a good tool to spread the dust around on hard surfaces. Bed bug powders cost about $10 and are available the same places you'll find the spray pesticides.

Create a kill chamber



OK, you've dealt with your room, clothes and bedding—now it's time to deal with your stuff. Everything in the bedroom needs to be treated: every book, shoe, lamp, photo, power strip, alarm clock, magazine, every knickknack and bric-a-brac ... everything! If you don't treat it, bag it, tie it up and throw it out.

Flat surfaces can be wiped with alcohol or sprayed with a bed bug–killing contact pesticide, but all items that have a small nook or cranny where bed bugs could hide (which is most stuff) need to be treated with penetrating fumes. Build yourself a kill chamber out of a large storage bin. Tape a pesticide strip to the side or lid of the bin, and seal your stuff inside for a couple days or however long the manufacturer recommends. Seal the lid of the bin with duct tape.

You can treat all your belongings by reusing the same bins; just make sure to keep your other stuff that's waiting to be treated bagged up in the meantime. Always wear gloves when handling pesticides and be sure to follow all safety instructions. The pesticide strips shown here are Nuvan ProStrips. A 12-pack of 16-gram strips costs $40 online.

KEEP 'EM OUT!

Don't pick up hotel bed bugs

Hotels are a common source of bed bugs, and even the best hotels can have infestations. Here's how to avoid bringing them home:

- Inspect mattresses when you arrive in your hotel room.
- Ask for a new room if you find them.
- Keep clothes and luggage off the bedspread and floor.
- Hang up clothes and keep other clothes in your suitcase, not dresser drawers.
- Keep suitcases in large bags tied off or in store-bought luggage bags.
- Bag up daily items like shoes and wallets.
- Bag up dirty clothes and transport them directly to the washing machine upon return.
- Wash clothes in hot water and dry thoroughly.
- Inspect luggage and store away from living/sleeping areas.
- Wipe luggage down with alcohol or spray with insecticide if you find bed bugs.

GETTY

Houseguests and bed bugs

Telling Aunt Harriet not to come for Christmas is probably not going to work (though it might be worth a shot), but you can still boss your kids around. Send your kids off to college with the information they need to inspect for bed bugs in their dorm room. And include as a parting gift a package of a few detection traps.

Instruct those returning scholars to bag up their mountains of dirty laundry and leave the bags in the garage until transporting them directly to the washing machine. Wash clothes in hot water and dry thoroughly.

Use heat instead of chemicals

Insecticides are an effective way to eradicate bed bugs, but not the only way. If you or someone in your house is highly sensitive to chemicals, or you're just not crazy about the idea of spraying chemicals where you sleep, kill the little blood suckers with heat. Temperatures above 120 degrees F kill all stages of bed bugs. Steamers can be used to treat all the same areas where you would have sprayed contact killers. Steamers like the one shown at top left cost about $150 and are good for many other projects like removing wallpaper, cleaning tile, removing labels, cleaning engine parts and removing wrinkles from fabric.

Heat chambers like this one (**below left**) can be used to heat personal belongings and kill any hidden bed bugs without chemicals. They come in various sizes, and prices start at less than $200. In the summer, you could let Mother Nature do the dirty work. Bag up your belongings and set them on the driveway. On a day when the temp tops 95 degrees, a bag placed in the sun should easily reach 120 degrees F inside.

ZAPPBUG

JAY BRUESCH

Turn up the heat

Professional heat treatment is one of the least invasive ways to get rid of bed bugs. Large heaters are used to heat entire rooms up to more than 120 degrees F for a few hours. Unfortunately, these large heaters are expensive, and whole-house treatments can cost thousands of dollars.

BY RICK MUSCOPLAT editors@thefamilyhandyman.com

Cartop Carrier Smarts

Getting building materials home from the lumberyard or home center is easy if you own a pickup truck or a minivan. But you can also haul items on the roof of your car or SUV if you've got a roof rack, obey the rack's weight limits and properly tie down the load.

That last point is the most important, because improperly secured loads can fly off your vehicle and injure people when you're driving down the highway, or even just turning or stopping. In fact, improperly secured loads cause more than 25,000 crashes annually, resulting in more than 90 deaths and many more injuries. If your load injures someone, you can count on hearing from one of the many hundreds of attorneys who specialize in just this type of case. So forget about using twine or bungee cords. You need real tie-down gear and the correct tie-down procedures to get your load home safely.

We contacted the experts at Thule and Yakima, the two largest roof rack manufacturers, to get their input on safe hauling. We'll share their advice on how to adapt your factory rack to carry a heavier load and show you how to secure building materials so they stay in place all the way home.

MEET THE EXPERTS

CHRIS RITCHIE is the communications manager for the Thule Group. An outdoors enthusiast, he uses the company's products to haul his bike and skis.

GARRETT BARNUM is the category director for Yakima Products. Garrett drives an SUV loaded with bikes and camping gear.

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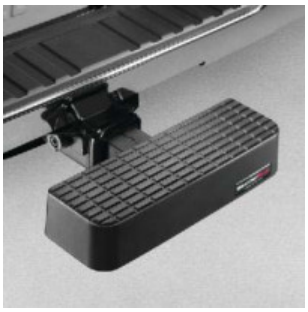

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UPGRADE A FACTORY ROOF RACK

The rack that came with your car may look rugged, but most have a load rating of only 100 lbs., the equivalent of just nine 8-ft. 2x4 studs. If that's all you plan to haul, you don't need to modify your factory rack.

But if you plan to haul more than 100 lbs., buy a set of heavy-duty crossbars to retrofit your factory rails (less than $350 per set from thule.com and yakima.com). Retrofit crossbars are wider than the factory units, are flat instead of curved, and carry more weight, as much as 200 lbs., depending on the vehicle.

The factory roof rack on our 2010 Subaru has convertible crossbar/side rails. If that's the style you have, just switch them into side rails as shown. Otherwise, remove your factory crossbars and install the new ones on the factory rails.

IF YOU HAVE A ROOF RACK, UPGRADE THE CROSSBARS
Lift the front and back crossbars onto the factory side rails. Space them according to the crossbar manufacturer's instructions. Then secure the feet to the rails using the wrench provided.

ADD A REMOVABLE ROOF RACK

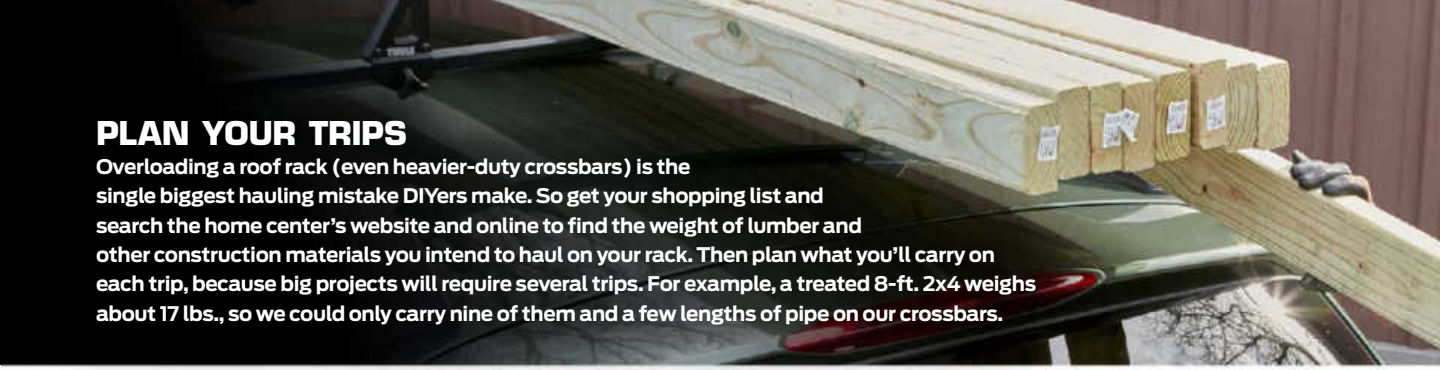
If your car doesn't have a roof rack, you can add one without drilling any holes in your roof. Buy a set of universal crossbars and towers and a set of vehicle-specific clamps to attach it. This Yakima unit for this Camry costs about $380.

The best part about buying universal crossbars is that you can use them on more than one vehicle. Just buy the vehicle-specific clamps and install them in the towers. If you want to leave the crossbars on your car, buy a set of lock cylinders and install the towers to prevent theft. Otherwise, remove the crossbars to increase your gas mileage.

To install the crossbars, just locate them according to the directions that came with the clamps. Adjust the tension screw on the tower, then snap the lever down to lock in place.

INSTALL A RACK ON A BARE ROOF
Open all four doors and locate the crossbars and rubber-cushioned feet in the recommended locations. Then swing the locking lever down to secure the clamp to the roof.

ART DIRECTION **VERN JOHNSON** • PHOTOGRAPHY **TOM FENENGA**



PLAN YOUR TRIPS

Overloading a roof rack (even heavier-duty crossbars) is the single biggest hauling mistake DIYers make. So get your shopping list and search the home center's website and online to find the weight of lumber and other construction materials you intend to haul on your rack. Then plan what you'll carry on each trip, because big projects will require several trips. For example, a treated 8-ft. 2x4 weighs about 17 lbs., so we could only carry nine of them and a few lengths of pipe on our crossbars.

3 STEPS TO SAFELY LOAD YOUR RACK

Many DIYers don't think about how they'll secure the load once they get the items onto the roof. So they rely on the free twine provided at checkout. Or they buy inexpensive bungee cords at the store. That's a big mistake.

Bring your own tie-downs

A roof rack's load rating is based on a "static load"—the weight of the load when the vehicle isn't moving. But once you hit the road, turn, encounter bumps and dips, or slow down, inertia multiplies the weight of your load by four to five times. So your tie-downs must be strong enough to keep the items from shifting or flying off. You'll need a minimum of four 14-ft., 1,000-lb.-rated ratchet straps to get your load home safely.

Secure the load

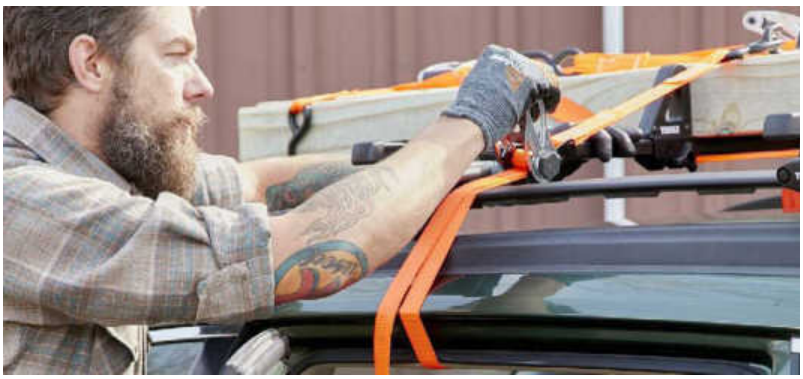
This three-point tie-down and bundling method may seem like overkill, but it's really the only safe way to get material home without damage or injury. Start by loading dimensional lumber onto the rack with the narrow edges resting on the crossbars. Then secure the front and back ends of each lumber bundle with ratchet straps to prevent movement (**Photo 1**).

Next, secure the load to the rack using ratchet straps (**Photo 2**). That prevents the bundle from sliding forward, backward or side to side. Then run a ratchet strap around the entire load and through the rear doors (**Photo 3**). This important step counteracts the "lift" created by air coming off the windshield and is especially important if you have a factory roof rack that's held in place only with small rivets. (See "Use Your Head When You're Hauling," p. 82.)

If your load extends over the hood of the car, secure it with hood loops and cinch straps (see p. 83).

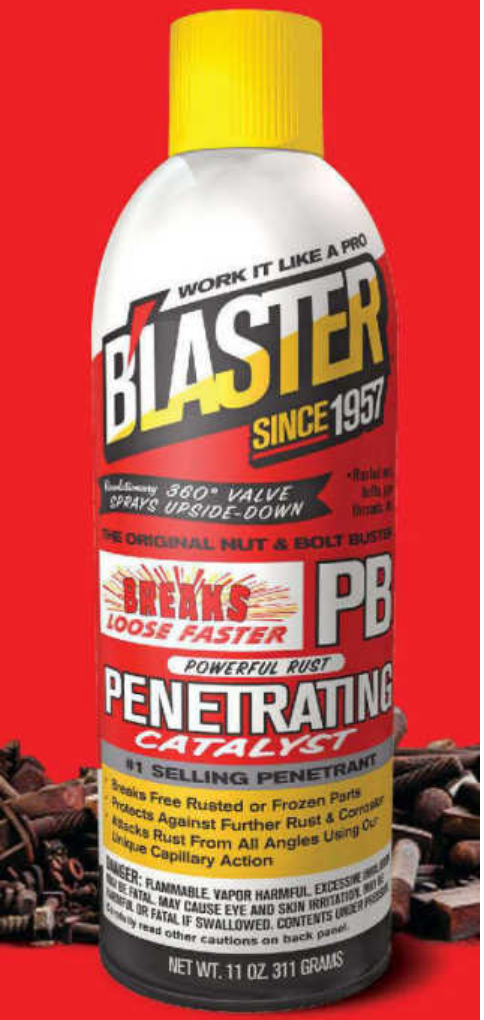
1 SECURE THE LOAD TO ITSELF
Wrap the straps around the lumber bundle at the front and rear. Then tighten until you can't move the middle pieces.

2 SECURE THE LOAD TO THE RACK
Hook a ratchet strap to the front bundle strap. Then wrap this strap around both crossbars and tighten. Repeat for the rear end of the bundle.



3 SECURE THE RACK TO THE VEHICLE
Open the rear doors and run a ratchet strap over the top of the rack and through the rear seat area of the passenger compartment. Make sure the strap is behind the driver's headrest and tighten.

Your Knuckle Busting Days are Over.



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TAPE THE LIGHTER ITEMS

Start the duct or nylon filament tape about 6 in. back from the end of the bundle and wrap it around to the opposite side. Repeat to cover the end of each item. Then wrap tape tightly around the entire bundle at the front and rear, making sure you cover the pieces of tape applied earlier. Then secure the bundle to the rack with ratchet straps.

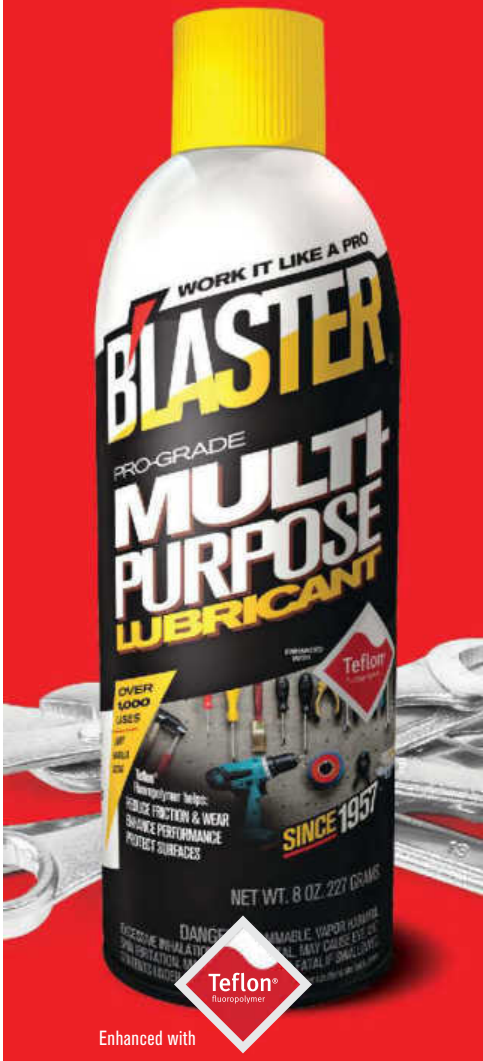
USE YOUR HEAD WHEN YOU'RE HAULING

- **Special items require special rack attachments. Contact the rack manufacturer to buy attachments for bikes, boats and camping gear. Never jury-rig those items to a standard roof rack.**
- **Roof loads change the dynamics of your vehicle, and the extra weight increases stopping distances. So stay off the highway whenever possible, drive slower, brake sooner and make wider, slower turns.**
- **Pay attention to overhead clearances, especially when entering your garage.**
- **Sometimes it's just not worth it to haul it yourself. Heavy-duty crossbars, add-on racks and ratchet straps often cost more than the store charges for a delivery right to your door, especially when you add in the risk factor!**
- **Never connect hooks, rope or straps to a bumper or fender well. A shift in weight can crack the plastic, scrape the paint or bend the body panels, costing hundreds to repair.**
- **A bare roof can't carry a load because it can't distribute the weight out to the pillars and door frames. If you place a load on a bare roof, you'll damage it.**
- **Never haul sheet goods or mattresses. The huge surface area can create enough lift to rip the entire rack off your vehicle. See below!**

SECURE THE OVERHANG

Pop the hood and drop in temporary hood straps. Or mount the straps permanently under a fender bolt. Run a rope or cinch strap through them and over and around the leading edge of the overhanging load. Snug the cinch strap just enough to prevent upward movement, but not enough to bend the hood. Hood straps start at about $15 per pair.

The Most Versatile Tool in the Box.



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Rust Bolt Warriors

Top Ten TIPS

BY TRAVIS LARSON editors@thefamilyhandyman.com

Installing T&G Boards

Installing tongue-and-groove (aka T&G) boards is a fast, inexpensive way to panel any ceiling or wall. You can install T&G over bare framing, drywall or plaster, so it's a great cover-up for an ugly ceiling.

Most of the T&G you'll find at home centers and lumberyards is 1x6 or 1x8 spruce. But other wood options and sizes can be special-ordered. Some boards are rough on one face and smooth on the other. Others, like the 1x8 boards used here, have a groove down the middle of one face to give the impression of more, narrower boards. Most stores carry 1x4 beaded ceiling board as well. These tips apply to any of the styles.

MEET THE EXPERT

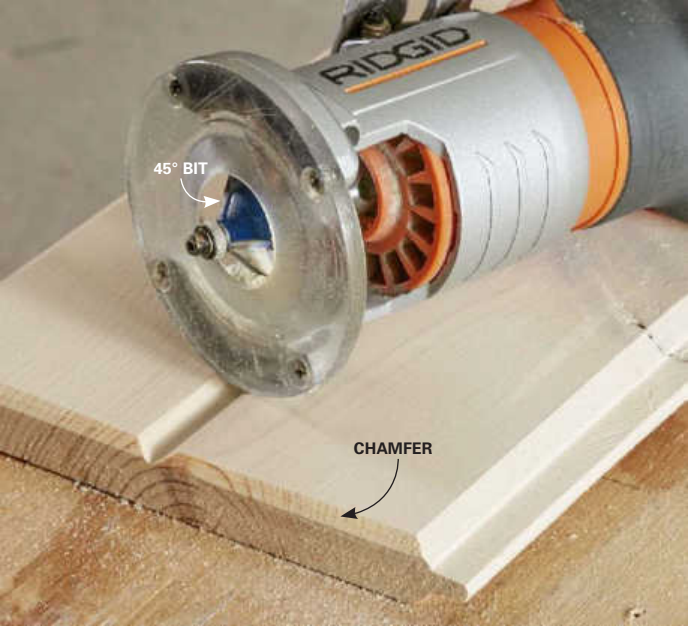
Travis Larson, the senior editor at *TFH*, has installed acres of tongue-and-groove during his 20-year stint as a carpenter and contractor. In fact, his geodesic dome home and dome shop ceilings are completely paneled with it—cedar in the house, pickled spruce in the shop.

1 Finish before installation

Tongue-and-groove boards are notorious for shrinking and expanding with changes in temperature and humidity. Unfinished boards installed in humid summer conditions can be an ugly mess during the dryness of winter. As the wood dries and shrinks, unfinished stripes will appear where the tongues withdraw from the grooves. But if you apply finish before installation, the tongues will be completely finished—no unfinished stripes to appear later!

2 Start with battens on finished ceilings

If you're installing T&G over drywall (or plaster especially), it's a good idea to install 1x2 battens and fasten them directly to the framing with 2-1/2-in. screws. They'll give you a much more solid nailing surface. If you try to nail through the T&G and the drywall, you can't be sure the nail will penetrate far enough to securely hold. Also, the battens will somewhat flatten out uneven ceilings. Another plus: You can run the battens either parallel or perpendicular to the ceiling framing, depending on which way you want the T&G to run.



3 Prep the ends

Recut the ends of every board. You'll remove staples left over from shipping wrap, cut away any splits and get clean, square edges. One of the best tricks to get a professional-looking installation is to add a 45-degree bevel, called a "chamfer." This technique is called "V-grooving." The V-groove will mask small inconsistencies in butt joints. You can either apply finish to the raw wood on each chamfer before nailing up each board or touch up the entire ceiling after it's finished.

4 Blind-nail the tongues

Always plan your work so the tongues point toward the direction of installation. One of the cool things about T&G is that you can use a technique called "blind-nailing." If you do it properly, you won't have any nail heads showing or holes to fill. Drive the nails through the shoulder of the tongues into the framing at about a 45-degree angle. The next grooved edge will hide the nail holes. A 15- or 16-gauge brad nailer with 2-in. nails is the best choice for fastening, although an 18-gauge nailer will do the job too.

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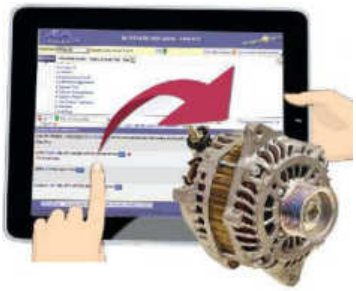
5 Beat them in!

Installing T&G can be a real workout. Think about it: (1) You're usually working over your head. (2) You have to seat the tongues and grooves together, and they don't always want to marry. (3) T&G isn't always flat, so you have to force the boards together to get them seated. The best way to do that is also the fastest way: Use the side of the nailer to tap (and sometimes pound) the boards together. If you start crushing the tongue too badly to get the next board seated, grab a short chunk of waste to use as a sacrificial board. Don't beat yourself up trying to preserve a pristine tongue—it gets buried in the joint anyway.

6 Stagger butt joints

There's no reason to try to join butt joints directly over framing members. They can fall anywhere because the tongue-and-groove joints support one another. Plus, if you cut the boards so they fall directly over framing, you'll waste a lot of material. Instead, choose lengths so the joints look as random as possible.



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A Hold the board in place next to the box and mark the sides.

7 Sneak up on cutouts

It's really tricky to accurately mark cutouts for electrical boxes and other ceiling openings on T&G. The secret is to scribe and/or mark as much as possible in place on the ceiling rather than to try to measure everything perfectly. After you draw the opening, make the cut with a jigsaw and test-fit the board. If it doesn't fit, you can tweak the cut. But if you really blew it, don't sweat it. Just cut out the bad spot, use the parts elsewhere and take another swing at it. You'll be wasting only a few inches of material.

B Mark the front and back of the box on a scrap.

C Transfer those marks to the board and lightly draw a square. Draw the opening using another box as a pattern.

8 Break off the groove flanges

On any installation, you'll have times when you can't fit the groove in the previous tongue and seat the board. In fact, it's almost always the case with the very last board. But it can also happen at ceiling protrusions or even at projecting inside corners.

The only option is to eliminate the back of the groove so you can lift the board directly into place without locking the joint together. The easiest way to do this is to break off the flange with a few hammer raps. These pieces can't be blind-nailed—you'll have to face-nail them and fill a few nail heads.

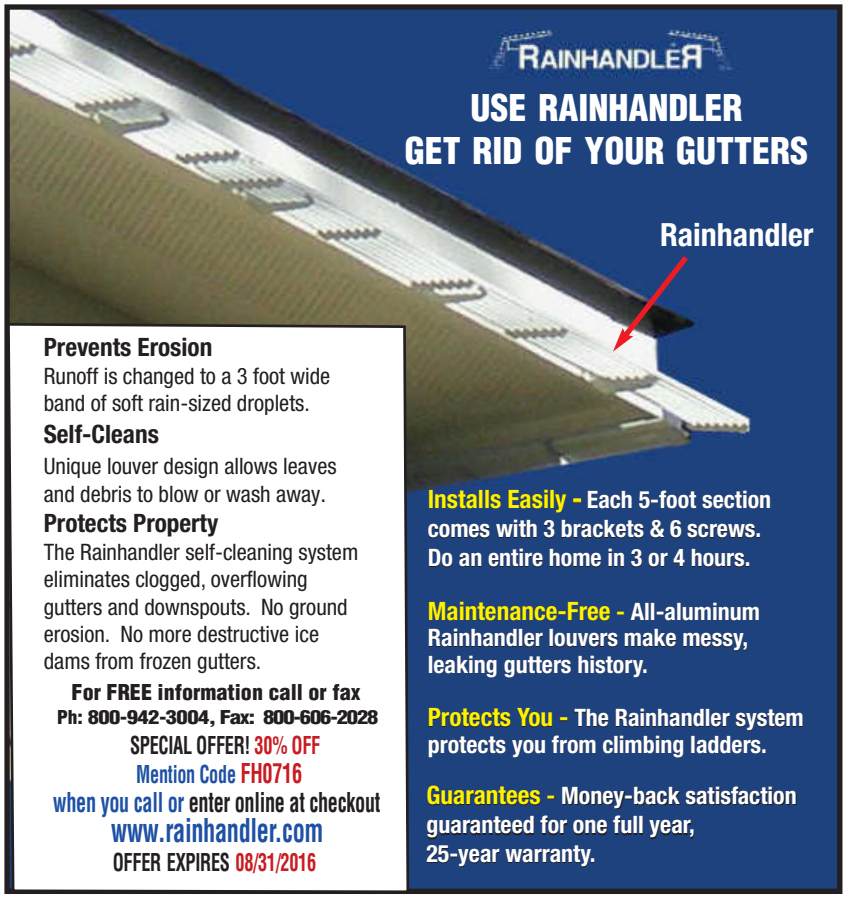
ART DIRECTION **VERN JOHNSON** • PHOTOGRAPHY **TOM FENENGA**

9 Close the end joints

Once you get a board seated, go ahead and add a nail or two. But before you permanently nail the entire piece, check the butt end to make sure it's tight against the neighboring board. If there's a gap, tap on the end with a block to close it. Then finish nailing off the board.

10 Cut problem boards shorter

Don't fight warped, twisted or bowed boards; cut them shorter. In fact, it's OK to install boards that are only a couple of feet long. They'll look great, and you won't waste any expensive wood.



BY JASON WHITE editors@thefamilyhandyman.com

Smart door locks

You and your family may never have to worry about getting locked out of the house again. "Smart" door locks—especially dead bolts—have gotten so clever that you don't even have to remember to carry a key with you anymore (although we recommend it).

ART DIRECTION MARCIA ROEPKE • PHOTOGRAPHY TOM FENENGA

Features available

Most smart locks are easy to install and set up, even if you're not very handy. And it's pretty easy to find one with the exact features you want for $150 to $500. Features such as:

- **Keyless entry**. This is basically what makes a smart door lock "smart." Thanks to electronic keypads, key cards and fobs, fingerprint scanners and smartphone technology, frantically fishing in your pocket for a house key while holding an armload of groceries can be a thing of the past. Some smart locks will even allow you to open a door via a smartphone app when you're away from home, so you can let in anyone who needs access.
- **Motorized throw bolts**. Some smart dead bolts have a motor inside to move the throw bolt through the strike plate. If you have to pull your door closed tight with one hand to compress the weather stripping while locking it with the other, a smart lock with this feature may not work well for you.
- **Alerts and activity logs**. Thanks to smartphones and apps that work with your smart lock via Wi-Fi and Bluetooth, it's possible to see who's coming and going at your house. Some will also tell you when you need to replace the batteries and allow you to send virtual keys to other people.
- **A variety of styles and finishes**. If you're worried that a new smart lock won't match the rest of your door's hardware, worry not. You'll find a variety of colors and metallic finishes to match most existing door hardware.
- **Backup keys**. Because technology doesn't always work, and batteries eventually die, most smart door locksets and dead bolts come with keys that let you unlock them. We highly recommend carrying one of these keys with you or keeping one in a safe hiding place outside, just in case!

Before you go shopping for a smart door lock, decide what features best suit your lifestyle and checkbook. Here's a small sampling from different companies. You can find many more by going online and searching for "smart door locks."

ARE SMART LOCKS SAFE?

Any device connected to the Internet is a potential target for hackers. Smart locks are no exception. In a worst-case scenario, a high-tech crook could unlock your door. We weren't able to find any reports of smart-lock crime, but the potential exists. For more on this topic, search online for "smart lock security issues."

SAMSUNG FINGERPRINT DIGITAL DOOR LOCK

SAMSUNG

Unlocks with your fingerprint

If you like being on the cutting edge of technology, then the Samsung Fingerprint Digital Door Lock ($420) could be what you're looking for. This lockset is loaded with high-tech features—most notably a fingerprint scanner. In fact, it'll register and recognize up to 100 fingerprints.

You can also enable the lockset's "double authentication mode" setting, which strengthens security by requiring both a password and a fingerprint to unlock. The lock can also be operated using an RFID (radio frequency identification) card, key fob or metal backup key. It also has a built-in alarm that goes off if a burglar breaks in.

Note: The installation manual recommends keeping wet hands and water away from the lockset, so install it only on doors that have protective overhangs. It's also a full-mortise lockset, which calls for some advanced carpentry skills to install it. For more info, visit samsungdigitallife.com.

AUGUST SMART LOCK

Motorize your existing dead bolt

The August Smart Lock ($200 at store.august.com) is a great choice if you don't want to change how the outside of your door looks. That's because it works with your existing dead bolt hardware.

Available in four colors, this ingenious smart lock replaces your dead bolt's interior thumb-latch and uses Bluetooth technology to turn your smartphone into a wireless key, which activates a motorized throw bolt that unlocks as you approach the door and locks when you leave.

It keeps an activity log of who's coming and going, which you can view on your smartphone using an app. The app also lets you control the lock remotely with an August Connect accessory ($79). You can create virtual keys for other users, and use your existing dead bolt keys as backups. The manual is well illustrated and easy to understand, making installation simple on most existing dead bolts. Runs on four "AA" batteries.

KWIKSET KEVO

KWIKSET

Opens with the touch of a finger

Even though it's not a fingerprint scanner, the Bluetooth-enabled Kwikset Kevo ($200) makes it possible to use your finger as a key. Your smartphone alerts this dead bolt when you're near the door and activates a motorized throw bolt after you touch the lock with your finger.

If you don't have your smartphone with you, use the included Bluetooth fob (additional fobs are sold separately) or one of the included traditional backup keys. Or, if you prefer, the lock's SmartKey feature allows you to rekey the lock to an existing key. You can also send virtual "e-keys" to other people to grant them access. A free smartphone app lets you keep track of comings and goings.

The Kevo also integrates with an existing Nest thermostat. Each time you come and go, you'll get a notification on your smartphone allowing you to adjust the temperature within the Kevo app. The Kwikset Kevo comes in three finishes and runs on four "AA" batteries. For more info, go to kwikset.com/kevo.

On the House

With the Carey Brothers
Tips of the Month

WINDOW (COVERINGS) SHOPPING MADE EASY

Smart phones, tablets, computers and the Internet have empowered the American consumer – particularly when it comes to home improvement. There's no shortage of decorating and design ideas to satisfy any home improvement enthusiast. Besides shopping from the comfort of your home, you don't have to fight traffic or vie for attention at your local retailer. In fact, many consumers – pro and DIYer – are reporting a better overall experience online than in-store. Recently, one of our clients decided that her job would not be complete without new window coverings throughout her home. In addition to freshening up the appearance of her home, she wanted to cut down on heat from her windows to prevent fading to fabrics and flooring. She couldn't afford blinds as bid by a local retailer. And due to a previous poor experience, she said that she would "never buy blinds again from a store that sells 2 x 4's and roofing." So, she decided to try her luck online with BlindsChalet.com She was able to shop from a wide assortment of custom choices for different rooms – cellular shades, solar screen and plantation shutters. A website video showed her how to measure and she received free samples to be sure she'd be satisfied with the color and texture. And, although BlindsChalet.com offered to hook her up with an installer, her husband made easy work of the project. No sales tax, free shipping, quick turnaround and a lifetime warranty sealed the deal. For more information visit **BlindsChalet.com**.

WINNING THE WAR ON MOLD AND MILDEW

Excessive moisture and humidity caused by showering, cooking and doing laundry can lead to mold and mildew. Showers, tubs, window frames and sills, and even walls and ceilings often look like a full-blown science experiment! What to do? The makers of Wet & Forget Outdoor, the safe and effective 'no scrub' means of getting rid of mold, mildew and algae outdoors, have come up with Wet & Forget Indoor Mold & Mildew Disinfectant Cleaner. The convenient spray and wipe formula cleans, deodorizes and disinfects all in one! Simply spray the contaminated surface, wait ten minutes and wipe dry with a clean cloth, sponge, mop or allow to air dry. It gets better. Now that you have mildew under control, it's time to tackle your grungy shower with Wet & Forget Weekly Shower Spray.

Spray once a week on fixtures, shower curtains, enclosures, shower glass, shower tiles and tubs after the last shower of the day. The next day, simply rinse the surfaces before or during your shower to keep it sparkling clean. No bleach, ammonia or irritating fumes. What could be better? **WetandForget.com**.

Ask the Carey Brothers a home improvement or remodeling question on their live radio broadcast every Saturday from 9:00 a.m. to 1:00 p.m. Eastern Time.

Call toll-free at **1-800-737-2474** to ask your question.

Visit their website at **OnTheHouse.com** for recaps of the show & other helpful info.

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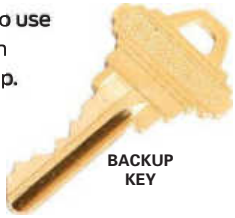
SCHLAGE CONNECT CAMELOT

Simple lock, sophisticated features

Schlage has offered keypad dead bolts for a few years, but it has new ones now with a few extra bells and whistles—like the Schlage Connect Camelot ($150 to $230) shown here.

It has a touch-sensitive keypad and will store up to 30 codes. It also has a motorized throw bolt that locks and unlocks when you enter your code, and a built-in alarm that sounds if somebody tampers with the lock or breaks in. It's compatible with Z-Wave home automation and comes in several finishes. You can also use a regular key as an emergency backup. Runs on four "AA" batteries. Learn more at schlage.com.



CALL IN REINFORCEMENTS!

While smart door locks add brains, sometimes what you really need is more brawn. An electronic dead bolt isn't worth much if your front door is easy to kick in. Regardless of what door lock you choose, consider beefing up your door and jamb with reinforcement hardware. It only takes about an hour to install and costs $20 to $110, depending on your specific needs.

1 REINFORCE THE DOOR
Slide a reinforcement plate ($10 to $25 at home centers) onto your door and reinstall your dead bolt and latch. Then secure the plate to the door with the included screws.

2 REINFORCE THE JAMB
Install a reinforcement plate like the StrikeMaster II on your door's jamb ($90 at asafehome.net). Start by extending the dead bolt slightly and close the door. Now take a pencil and mark the location of the bolt's center on the edge of the doorjamb (see photo above right). Do the same thing for the center of the latch. Extend the pencil marks to the doorstop. Line up the center of the latch alignment hole on the reinforcement plate with the centerline mark on the doorstop and slide the plate into place. Predrill holes and run the supplied screws almost all the way into the jamb with your drill. Stop before they're seated or you'll bow the door frame.

DIY Quiz

BY ERIC SMITH editors@thefamilyhandyman.com

Put on your thinking cap and take this month's quiz to see just how smart you are when it comes to DIY. Here's how it works:

- There are easy, intermediate and really tough questions all mixed together.
- There may be more than one correct answer!
- Get the answers and your DIY rating on p. 103. Good luck!

ART DIRECTION MARCIA ROEPKE • PHOTOGRAPHY HSP

1. A saw cut like this one is called:
A. A crosscut.
B. A compound angle cut.
C. A beveled rip cut.
D. A right-angle bevel cut.

2. Before grouting natural stone tile like slate or marble, you should:
A. Seal it with a tile sealer.
B. Wet it down with water to keep the grout from drying out too quickly.
C. Coat it with acrylic polyurethane.
D. Apply a generous coat of grout release.

3. Is the term "lefty-loosey" (when applied to loosening a screw, bolt or nut) just another way of saying "turn it clockwise"?
A. Yes
B. No
C. Only in the northern hemisphere.
D. Only if you're left-handed.

4. Depending on the type, outside corner bead for drywall can be installed by:
A. Embedding it in joint compound.
B. Nailing it with drywall nails.
C. Crimping it.
D. All of the above.

5. When filling a deep crack with caulk, it's a good idea to first:
A. Fill it with expanding foam.
B. Squirt in a first layer of caulk, let it dry overnight, then finish with a second layer of caulk.
C. Push in foam caulk backer rod.
D. Dampen it with water.

6. Why would window manufacturers use tempered glass for residential windows?
A. Safety
B. Strength
C. Appearance
D. UV protection

7. True or False? If you apply crabgrass preventer at the right time in the spring, you won't have any crabgrass for the entire warm season.

8. True or False? You can tell if an alkaline battery is good just by dropping it on a solid surface.

9. A pipe's "I.D." is its:
A. Internal dimension
B. Identification number for the National Plumbing Association
C. Interior diameter
D. Inside diameter

10. In hot climates, how much can you save on cooling costs by selecting light-colored shingles instead of dark?
A. 4 percent
B. 9 percent
C. 20 to 23 percent
D. 72 percent

FIND THE DIY QUIZ ANSWERS ON P. 103.

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62160/62496
62516/68053
60569 shown

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- 5 mil thickness

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SIZE	LOT
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LG	68497/61360
X-LG	68498/61359

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YOUR CHOICE

$5.99 comp at $14.97

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Customer Rating

MOVER'S DOLLY

HaulMaster

LOT 61899/60497/62399/63095
63096/63098/63097/93888 shown

- 1000 lb. capacity

$7.99 comp at $19.97

SAVE 59%

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Customer Rating

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Customer Rating

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DIY Quiz Answers

1. (**B**) Also sometimes called a compound miter cut, this type of cut combines an angle cut with a bevel cut. You need to make cuts like this when you frame a roof. The board shown on p. 94 could be either a "valley jack" (for forming a valley) or a "hip jack" (for a hip roof).

2. (**A or D**) Either tile sealer or grout release will work. Sealer enhances the color and sheen of natural tile, while grout release leaves the tile as is. Always use one of these products before grouting stone or unglazed tile; otherwise the grout will be almost impossible to clean off.

3. (**B**) Lefty-loosey means counterclockwise.

4. (**D**) Paper-faced corner bead gets embedded in joint compound. Ordinary metal corner bead can be nailed, crimped or even stapled into place. But it should also be taped along with the other wall joints to prevent cracks from showing up later.

5. (**C**) Foam caulk backer rod comes in several different diameters. Use a size that's slightly bigger than the crack so it seals the gap and stays in place. Leave about 1/4 in. of space for caulk.

6. (**A & B**) Tempered glass is ordinary glass that's been heated to high temperatures and then quickly quenched with cool air. That not only makes it much stronger but also causes it to shatter into tiny pieces when it breaks instead of into dangerous large, sharp shards.

7. **False**. If you apply preventer between the second and third times you mow, you'll prevent most of your crabgrass from sprouting. But to get late bloomers, you should apply a second treatment about three weeks later.

8. **True**. Believe it or not, a dead battery will bounce when you drop it. A good battery will just land with a thud and fall over. Try it with a good battery and a bad battery and you'll see!

9. (**D**) Inside diameter. And "O.D." stands for—you guessed it—outside diameter.

10. (**A**) Surprisingly, choosing white instead of dark shingles doesn't amount to huge savings. However, a study performed in Florida by the Florida Solar Energy Center compared different roofing materials, including dark- and light-colored shingles, with highly reflective roofing materials like reflective S-tiles and white metal.

The study showed that the use of white S-tile and white metal surfaces did result in significant savings—20 percent and 23 percent savings compared with dark shingles. So if you live in a hot climate, shingles aren't the most energy-efficient option for your next roof.

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Beginner: 0 – 3 correct
Intermediate: 4 – 7 correct
DIY Guru: 8 – 10 correct

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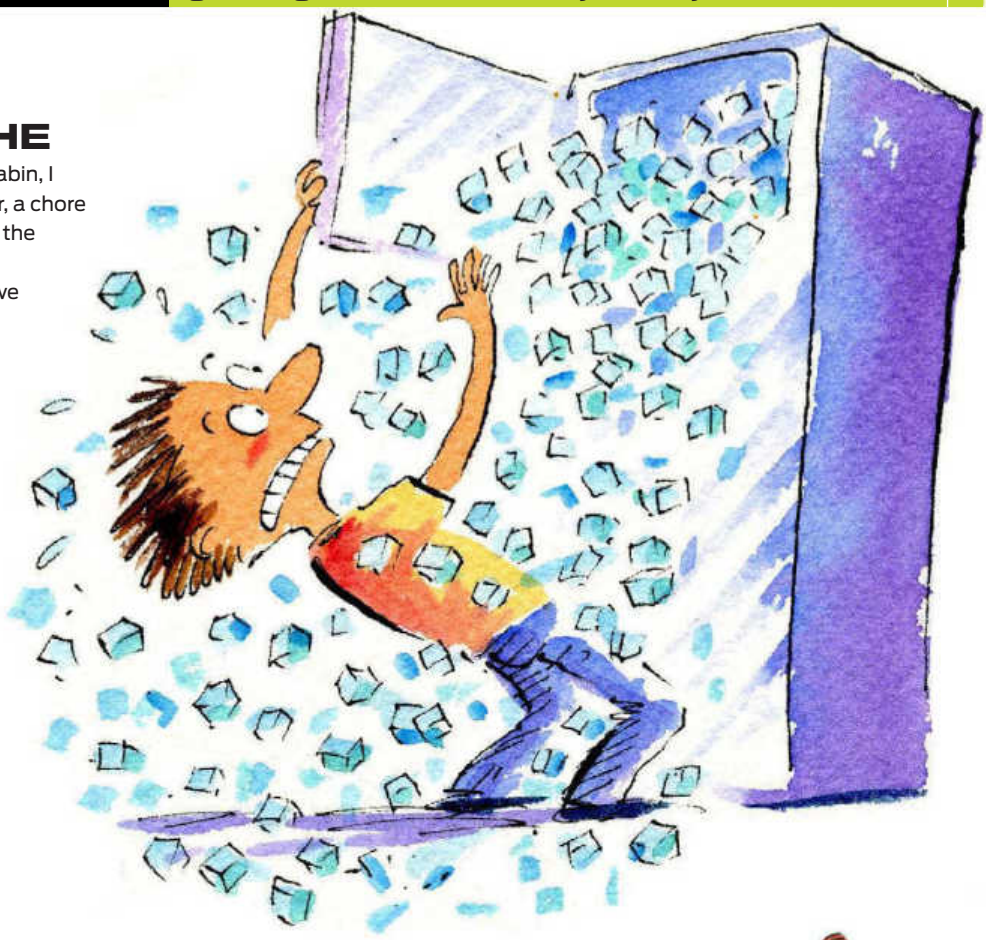
ICE AVALANCHE

Before leaving the family cabin, I cleaned out the refrigerator, a chore that included dumping out the old, stale ice from the ice-maker tray. The next time we visited, several weeks later, I opened the freezer door and was hit by an avalanche of ice. We had forgotten to replace the ice tray, which meant that the icemaker never got a signal that the tray was full, so it kept making ice until the freezer was completely filled with cubes.

Gerald Yaden



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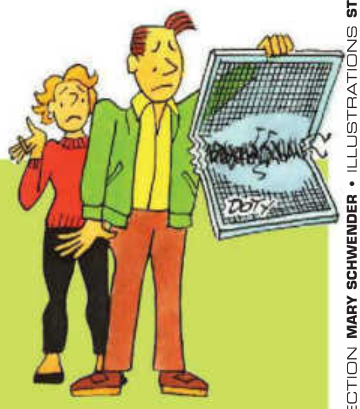
Ernie Smith



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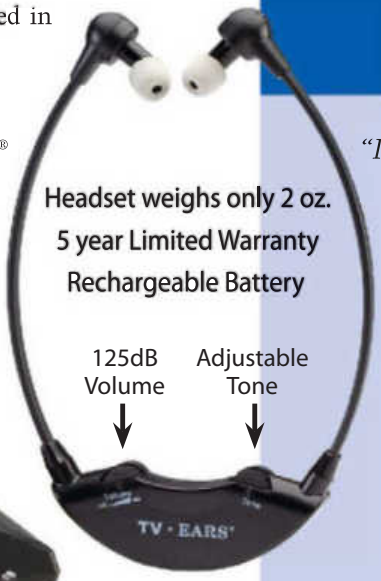

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